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BRITISH MEDICAL JOURNAL

LONDON SATURDAY AUGUST 9 1941

THE MENTAL DEFECTIVE IN THE ARMY*

BY

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It is vital to success in military operations that commanding officers should know the limitations and weaknesses of the units they employ no less than their numerical and physical strength. Mental defectives constitute such a point of weakness, a matter which is the more important because it is often not recognized till too late. This paper discusses the evidence that mental defectives are a hindrance to a modern army, easy and quick methods of detecting them, and recommendations for removing the more serious cases of defect at an early stage.

The Defective a Hindrance to the Unit

The mental defective differs from the normal person in that he is less able to meet new situations, is backward in learning, has less foresight and therefore does not appreciate the risks he is bringing on himself and others, has less initiative, and is slower in thought and action. In the Army of to-day, in which complicated machines are increasingly used, speed in action is essential both to success in battle and to the safety of the unit; the soldier must have more initiative and a better understanding of technical apparatus than were needed in former wars. The bow-and-arrow was simpler than the flintlock, which is a toy beside the machine-gun. The mental defective who can only master the rifle is at a disadvantage compared with those who can handle, clean, and maintain more complicated weapons, and he cannot in an emergency give them enough support.

Mental defectives are slow learners, and therefore hold back the training of normal men. The lower the mental age the more difficult they are to train. In my experience all those of a mental age of up to 7 years 11 months are untrainable; 86% of those with a mental age of 8 years, 58% of 9 years, 33% of 10 years, 28% of 11 years (see Chart).

Case A.—This man was notified by the National Service Recruiting Board to be "slow mentally and illiterate"; on account of this he was placed in Grade II. As he was untrainable he was sent to me for examination six months after joining up. His mental age was 5½ years. He told me he had been a sentry for five months. When asked about this, he said that he couldn't fire a gun and was generally terrified of being left alone in the dark. He had been put to guarding a gun site. In peacetime he could practically get no work. He had held two jobs in seventeen and a half years, and had been out of employment for fifteen years of this time.

Case B.—A man in the Royal Engineers was frequently crimed for petty offences, such as changing his billet without permission, arriving late on duty, etc. He seemed unable to realize that he had broken regulations, though he had been in the Forces for eighteen months; it was apparently impossible to train him as a soldier. His mental age was 6 years.

Case C.—This man wept copiously as soon as we began to talk. His medical officer said he was asocial and was shunned by his comrades. He was untrainable after five months in the Army and was useless even for fatigues. He was very worried about leaving his six children, as his wife was going to have another soon. He was illiterate, and his mental age was 4½. He did not know whom the war was against—in fact, he was not aware that there was a war on.

It would not have been difficult to discern that these men would never make soldiers if those responsible for their acceptance had been aware that mental deficiency was a definite hindrance to military efficiency.

The mental defective unable to cope with his new environment is more prone to report sick for small and varied ailments. In a series of 100 cases sent to me for examination for mental deficiency 42% were chronically sick. Most were not seriously or even moderately ill.

Case D.—A man aged 23, six months in the Royal Artillery, complained of pains in the feet and of inability to march or drill. He had been to an orthopaedic specialist, who could find no reason for the pains, but reported that he had double pes cavus; spectacles, which he said did not suit him, had been provided, and he had been to a dermatologist for ichthyosis. He had had his appendix removed in a general hospital, and later it was found that there was sugar in his urine. He had attended an open-air school and was physically frail. The N.S.R.B. placed him in Grade II. During performance tests he was described as a "lethargic twiddler," and on the Terman test he had a mental age of 9¼ years. His physical and mental conditions were degenerate and under-developed. Most of his six months of Army life had been "under the doctor."

R.M.O.s commonly report that it is the dull, inefficient soldiers who turn up most regularly at sick parades, that many of their ailments are quite trivial, and that "the defectives use their illness to get out of their difficulties." It would perhaps throw a broader light on the problem to say that when the defective is bewildered in his new environment his attention turns to his own bodily sensations, rather hypochondriacally, in the hope that the M.O. will supply a comforting bottle of medicine and suspend him from perplexing duty. If at the same time he is ordered to the sick bay then so much the better; for many defectives, when children, needed and received more parental care than normal youngsters. Being nursed is something they both know and enjoy. Such behaviour, however, lowers the morale of the unit and rouses resentment among those who are also struggling to adapt themselves to their new environment and to hold back their personal claims and troubles in the common struggle of war.

To frequent illness we may add clumsiness. A sergeant-instructor told me that it was the 20% whom he found most difficult to teach to drive who had the most accidents. Allowing for a few "accident-prone" (who are not always hard to teach), many of these slow learners and clumsy drivers were probably defectives.

* Based on a paper read to a meeting of the British Psychological Society at Nottingham, April 19, 1941.

Sample of Military Defectives

In a series of 100 mentally defective soldiers seen consecutively, 80% had mental ages of from 9 to 11, and 14% of from 5 to 8 years (see Chart). This distribution is not typical of the scatter of mental defectives in the population. It would be satisfactory to believe that the low- and medium-grade feeble-minded had been kept out by the recruiting boards; but that they are kept out is more probably due to the working of the Mental Deficiency Acts, 1913-38, for the majority of those whose mental age is 8 or less cannot support themselves at all and are in institutions, on licence, under guardianship, or notified to the local mental deficiency authority, and are therefore exempt under the National Service (Armed Forces) Act, 1939, Section 11 (f).

It will be noted that while more men with mental ages of 9 and 10 were useless to the Army than those with mental ages of 11 and 12, yet there are fewer of them in the general population. These men of 11 and 12 mental age are "military defectives" even more than they are "civilian defectives," since they cannot adapt themselves to such new and complicated duties as a modern army requires them to perform. In civilian life they could choose their occupations; if unable to do their allotted tasks they did not thereby endanger the lives of their companions and would change to work which was more congenial, and which gave them a sense of achievement rather than of frustration.

The above-mentioned 100 men were asked to furnish particulars of their various employments and the time they worked on them. From these times was compiled the following table, to which unemployment time has been added.

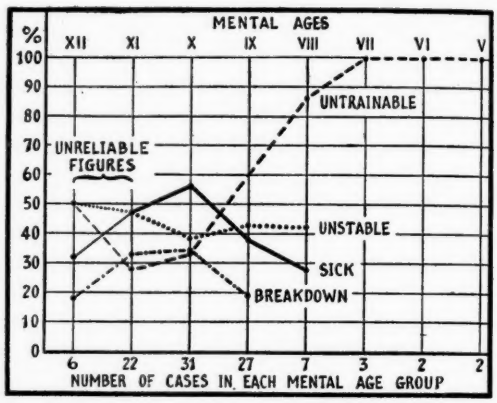
	Years		Years
Out of work	241	Shop assistants	46
General labouring	193	Delivery (mainly coal and milk roundsmen)	30
Coal-mining	153	Army and Navy Regulars	24
Machine feeding	104	Hand-truck pushers	23
Pedlar; hawker	74	Window-cleaning	17
Painter	73	Other occupations	91
Farm-hand	71		
Odd jobs (unemployed about 50% of time)	60		

Totals: Employment 959 years; Unemployment, 241 years.

Counting their potential working time as 1,200 years, these 100 men had been out of work about 20% of this—i.e., 241 years. It might engage the curiosity of M.O.s of units to find out whether their mental defectives do not spend a like proportion of their time in the Army on the sick list. The above list does not indicate the character of the work actually done—in the coal-mines, for instance, the men are mainly employed on the less skilled jobs—but it does show how they are occupied in a free market. In the Army, where duties are allotted and have to be carried out without much time for instruction, the defectives break down on the job. Men who are of so little use to the community in time of peace should not be allowed to hinder an army during wartime.

Analysing the reasons why these 100 men were sent for a psychiatric opinion, it was found that 50% were regarded by their M.O. or C.O. as untrainable; 25% were apparently stable before enlistment but broke down and were sent to hospital suffering from a psychiatric complaint which manifested itself after enlistment, the commonest symptoms being those of conversion hysteria and anxiety; 43% were unstable before enlistment, and their discharge was recommended on grounds of continued temperamental instability; 42% were regularly reporting sick or had some psychoneurotic ailment—i.e., over a half of them had more than one of these reasons for being sent for investigation.

In the light of the above figures it will not be a surprise that in an investigation of 904 consecutive cases admitted to a special centre for neurosis and measured by the progressive matrices 33% came from the lowest 10% taken into the Army. This would suggest that one way of reducing the incidence of neurosis in the Army is to keep out the mental defectives, who, though in a minority numerically, constitute a major problem.


MENTAL AGES
%
XII XI X IX VIII VII VI V
100 90 80 70 60 50 40 30 20 10 0
UNTRAINABLE
UNRELIABLE FIGURES
UNSTABLE
SICK
BREAKDOWN
6 22 31 27 7 3 2 2
NUMBER OF CASES IN EACH MENTAL AGE GROUP

Graph showing proportion of mentally defective soldiers breaking down, sick, unstable, or untrainable at various mental ages (100 cases).

Duration of Service before Mental Defect is Detected

When we remember that mental defectives by their slow-wittedness hinder the training of normal men and break down easily themselves, we become curious regarding the time that elapses before their defect is detected or it is realized that, in spite of painstaking endeavour, they may be untrainable. It may therefore be instructive to examine the following table showing the length of Army service of 100 mentally defective soldiers sent for examination.

Under 1 week	1	9-12 months	7
1-2 weeks	6	12-15 "	5
2-4 "	4	15-18 "	3
1-3 months	19	18-24 "	3
3-6 "	26	Over 2 years	4
6-9 "	22	(3, 4, 4½, 5½ years)	

(30)

These figures should be examined in relation to the stages of training. Though the work is relatively easy in the first three months, 30% showed clearly that they could not stay the course. During the next six months the soldier has to learn to handle more complicated weapons and to carry out military exercises which call for a greater amount of self-reliance in the face of complexity and uncertainty. It is therefore not surprising that 78% of the defectives examined had failed before they were ready for active service.

Aids in Spotting the Defective

The defective has, on the whole, a different school and work history from that of the normal soldier. Though no one would diagnose a defective on that history alone, the following points will help those who are uncertain whether to send a given case for an opinion to the psychiatrists attached to the recruiting boards or, if already enlisted, to the Command or E.M.S. psychiatrist.

There is generally one standard (form, class) for each year of the child's elementary-school life (7 to 13 years), corresponding with Standards I to VII. In the past, and therefore affecting the older soldiers, boys went up to a higher standard only if they passed the necessary test. Therefore when we find that a soldier did not reach one of the top three standards we may suspect mental defect.

In more recent years there has been a general tendency to avoid the inclusion in the same form of larger or older children among those who are less mature; the aim was to prevent deterioration of character and development

through the temptation to bully the younger ones. This was accomplished in two ways. In one the child was promoted yearly, and therefore left the school in the top standard. Defective soldiers educated on this principle will often admit that they were unable to keep up with their fellows and were therefore at the bottom of the class, or that their promotion was due to their age or size and not to their abilities. In the second way the schools were organized along the lines suggested by the Hadow Report—Standards V, VI, and VII being called Forms I, II, and III. These forms were subdivided into "streams" A, B, and C (also D in larger schools, only A and B in smaller). These "streams" generally represent ability: the dull children go in the C stream (and D in the larger schools) and the cleverer in the A stream. Exceptionally, the forms are subdivided according to the type of work done—e.g., A: commercial; B: technical (trades), etc.; so that dull and clever "commercials" would be in Form IIIA, and the B stream would include boys with, say, high mechanical ability.

Illiterate soldiers, and those very nearly so, are almost invariably mentally defective, unless there is clear reason for illiteracy—e.g., lack of schooling; those who attended special schools are generally defective from a military standpoint, and many who went to open-air schools are dull and defective (or, if not, should have special investigation on grounds of doubtful physical health). Soldiers from secondary or technical schools and colleges are unlikely to be mentally defective unless they were fee-paying scholars in a school without an entrance examination, when they may be defective.

The following table shows the standards from which 100 mentally defective soldiers left school compared with those from which 100 psychoneurotic soldiers left. It shows that of those who left in Standard IV or lower 5.3 : 1 (32 : 6) and of those from Standard V or lower 3.4 : 1 (54 : 16) were mentally defective.

	100 Mental Defectives	100 Psychoneurotics
Standard II	3	—
" III	12	1
" IV	17	5
" V (or Form I)	22	10
" VI (or Form II)	19	27
" VII (or Form III)	12	29
" VIII (or Ex-VII)	3	18
No schooling	5	—
Didn't know	3	7
Schools with unorthodox class numbering	3	2
College	1	1

54% = 32% (Standard II–IV); 16% = 6% (Standard II–IV)

Work Histories

Mental defectives often show characteristic features in their work histories.

(*a*) *Employability.*—The more defective a man the less likely is it that he can be employed usefully; therefore among those with long periods of unemployment will be found large numbers of mental defectives. Unless the nature of his work or local or other conditions are the cause, a period of unemployment of over three years at any time in a fit man's career should lead to a suspicion of mental deficiency or other mental trouble. If his unemployed time exceeds his employed time the same suspicion should be held.

(*b*) *Unremunerative Work.*—Defectives will often work for a wage that a normal man would regard as too low a one on which to live. Wages of £1 a week or less in the country or £1 10s. or less in town, or keep and 10s. or less in town, or 5s. or less in the country, would come into this category.

(*c*) *Types of Occupation.*—Certain types are favoured by defectives; they include such as: Ice-cream vendor, sandwich-man, handing round bills, odd-job man, newspaper vendor (street-corner), rag-and-bone man, door minder, scrap metal collector, tea masher, errand man, street sweeper or sweeper-up in works, cinema attendant (outside). The holding of any one of these jobs does not in itself constitute a pointer to mental deficiency or to mental disorder, but if a man holds a succession of them and does not rise above them though employment is available, or if he sinks to these levels after holding better posts for brief periods, then mental defect should be suspected.

Since these pointers are not aids to diagnosis, it is immaterial at this stage whether they indicate mental defect, severe neurosis, or mental degeneration: the differential diagnosis introduces other factors which need not be discussed here. It may also be noted that the pointers may be used by physicians who have not had special experience in mental deficiency, or even by their clerks.

American Experience

The problem of mental deficiency among soldiers is not new to military medicine, though it is sometimes neglected. During the war of 1914-18 the American Army introduced intelligence tests at the registration of recruits. The standard for rejection was "a mentality not exceeding that of a child aged 8 years"; for it was considered that below this level the "degree of incompetency was so profound that the individual, whatever his race or surroundings, could not be counted on to take care of himself." In spite of so low a standard, 1.2% of all men registered were prevented from joining that Army on grounds of mental defect. As a result of these tests only 0.2% of men admitted into the Army had to be discharged later as defectives because of their inability to train into useful soldiers. If the distribution of intelligence in America is comparable to ours in Great Britain the rejection of 1.4% for mental deficiency suggests that the Army in fact considered as defective men with a higher level of intelligence than 8 mental age years—perhaps 9 years. The increased use of mechanized units, and the necessity for speed of action and co-operation between scattered formations, leads me to conclude that in the majority of cases a mental age of 11 or less makes a man unfit to play a useful part in a fighting unit.

It would certainly, in the long run, prove an economy of effort to institute tests for intelligence during the recruiting examination of all persons. As such are not yet provided, the hints given above may prove of assistance.

Where the Defective is Useful

Much has been said about the defective's hindrance to efficiency; about his constituting a risk, his waste of Army time and equipment, and his clumsiness; and about turning or keeping him out: all this, while true, should not obscure the fact that, of 1,200 years which the 100 men might have worked, they did, in fact, between them put in 959 of gainful if fitful toil. Because they are mentally defective they cannot adapt themselves to new situations or acquire skill in fresh directions, but they can often do simple repetitive work and fill "blind-alley" jobs without hurt to their pride, and without boredom or injury to their ambition. It would therefore seem prudent in the national interest to put these men to such tasks as they can fulfil in civil life, where their defect will prove less of a hindrance.

According to the wording of the Registration for Employment Order, 1941, those exempted from the need to register for military service under the National Service (Armed Forces) Act, Section 11 (f)—such as notified mental defectives—are also exempt from registering under that Order. This arrangement makes it difficult for such men as are notified to the local mental deficiency authority to do work of national importance that may well be within their capabilities. If this Order were amended men unfit to be soldiers yet fit to do labouring or machine-feeding in a munition works could make their contribution to the national effort.

Recommendations

1. Those with a mental age of less than 10 years should be prevented at the recruiting boards from joining the Army or, if already enlisted, should be discharged.

2. Since those with mental ages between 10 and 12 are often unstable, break down more than the normal under active service conditions, and frequently report sick, they should be sent to a labour corps and receive special consideration at the end of three months' service. Due allowance for a fall in intelligence due to age should be made in the case of older soldiers (I allow a drop of 1 year of mental age for each decade after 25 years in computing the mean score for average older men).

3. To arrive at a rough assessment of the mental age the progressive matrices tests could be used; but the method of assessment is not so important, though there are several reasonably reliable methods. What is really important is that some systematic attempt should be made to eliminate the defectives.

4. Since some people will raise an objection to the idea of "weeding out" defectives it should always be stressed that the task is to keep certain less gifted members of the population at jobs in which they are stable and in which they can be of most use to the national effort.

Summary

The mental defective in the Army—slow to learn, prone to breakdown, a misfit and potential danger—is discussed. Aids in spotting the defective are given. It is pointed out that, though a hindrance in the Army, he may be put to useful work in civil life in wartime. Recommendations are made for handling the problem.

I wish to express my thanks to Dr. John Rickman for advice in the preparation of this paper.

HYPOPROTHROMBINAEMIA AND AVITAMINOSIS-K IN MAN

BY

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AND

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The control of haemorrhage in man is dependent on the "protective" reaction of the vascular tree to trauma and on the ability of the blood to coagulate normally. Although the former defence mechanism is not at all clearly understood, recent studies have demonstrated the validity of the so-called classical theory of blood coagulation (Eagle, 1939), and the majority of workers in this field now subscribe to Schmidt's (1895) original hypothesis, concisely expressed by the following equations:

$$\text{Prothrombin} + \text{Thromboplastin} + \text{Calcium} = \text{Thrombin (Thrombokinase)}$$

$$\text{Thrombin} + \text{Fibrinogen} = \text{Fibrin (Clot)}$$

Despite the fact that very little is known of the chemical nature of any of the organic constituents of the plasma, which react together to form a blood clot, clinical and experimental studies by chemists, biologists, and physicians during the past five years have provided a sound basis for the diagnosis and treatment of previously obscure haemorrhagic diseases. This advance in knowledge is in the first place due to the recent development of methods for the estimation of blood-prothrombin levels (Quick and others, 1935; Brinkhous and others, 1938; Dam and Glavind, 1938), which are more specific than those previously used (Howell, 1914); and, secondly, because Dam and his co-workers in Copenhagen were able to demonstrate that a fat-soluble substance, vitamin K, could restore the marked hyperprothrombinaemia and control the haemorrhagic tendency of experimental dietary "haemophilia" in chickens (Dam and others, 1936).

It is the purpose of this communication to discuss some of the clinical aspects of hypoprothrombinaemia and avitaminosis-K in man in the light of recent knowledge and as a result of personal observation of 178 patients in the Boston City Hospital during the past two years. The majority of these patients suffered from haemorrhagic manifestations and all were suspected of having a diminished blood-prothrombin concentration. Consequently their blood-prothrombin concentration levels were measured by

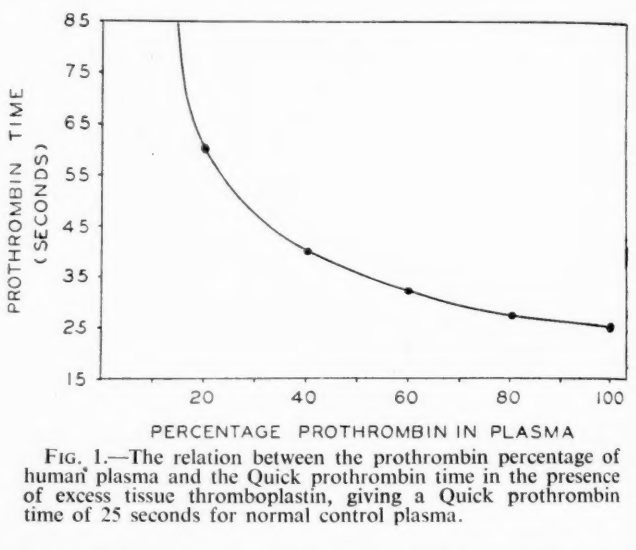

FIG. 1.—The relation between the prothrombin percentage of human plasma and the Quick prothrombin time in the presence of excess tissue thromboplastin, giving a Quick prothrombin time of 25 seconds for normal control plasma.

Quick's method. The test measures the *time* taken for a sample of citrated plasma to coagulate, after recalcification, in the presence of an excess of tissue thromboplastin, as compared with the time taken for a sample of *normal* citrated plasma to clot when treated in the same way. Conversion of these "times" to blood-prothrombin concentration are made by reference to a curve (Fig. 1) constructed according to the method of Kark and Lozner (1939).

The Quick test is extremely simple, and the recent introduction of a stable thromboplastin (Souter and Kark, 1940), requiring only the addition of distilled water before use, would seem to remove the one serious obstacle to the performance of the test in the physician's office, and also enables it to be performed with greater ease elsewhere. The Quick test is performed as follows:

4.5 c.cm. of blood is taken into a saline-washed syringe by means of a clean venepuncture, and mixed with 0.5 c.cm. of 2.5% solution of sodium citrate in a centrifuge tube. The blood is spun at 1,500 r.p.m. for five minutes and the plasma drawn off. The test must be performed on this plasma within the next six hours.

Thromboplastin is prepared by stripping the brain of a freshly killed rabbit of blood vessels and meninges and washing it in tap-water. The brain is then macerated, spread thinly on plate-glass, and dried in an oven at 37° C. for twenty-four to forty-eight hours. To each 0.5 gramme of this dried material 5 c.cm. of a 0.85% solution of sodium chloride is slowly added and thoroughly mixed into a thin paste. The paste is incubated for fifteen minutes in a water-bath at 56° C. and then centrifuged at 2,000 r.p.m. for five minutes. The upper layer of opalescent fluid in the centrifuge tube is used as a source of thromboplastin and retains its activity for from two to four days when kept in the ice-box.

To perform the test, 0.1 c.cm. of thromboplastin solution is pipetted into a 75 by 19 mm. tube, together with 0.1 c.cm. of plasma; such a clot forms within twenty to twenty-five seconds. Chloride solution, containing 0.277 gramme of calcium chloride per 100 c.cm. distilled water, is then added. The stop-watch is started and the tube is agitated for fifteen seconds in the water-bath. The tube is then removed from the water-bath and tilted gently up and down once or twice a second. The end-point is sharp, and occurs when the mixture suddenly ceases to flow smoothly and a clot is formed. In normal plasma such a clot forms within twenty to twenty-five seconds, *depending on the batch of thromboplastin used.*

It is extremely important to check each new thromboplastin solution against a normal control plasma before making observations on the plasma of patients suspected of having hypoprothrombinaemia.

Clinical Manifestations of Hypoprothrombinaemia in Man

A haemorrhagic state consequent on a reduction of active prothrombin in the circulating blood does not arise unless the blood-prothrombin level has dropped considerably. Although there is a wide margin of safety, personal observations indicate that the critical level for bleeding is somewhat higher than the 15 to 20% of normal which Quick (1938) originally postulated.

Of the 178 patients studied 53 had a haemorrhagic condition which was directly consequent on a marked hypoprothrombinaemia and which, in most instances, was controlled by vitamin K therapy. This condition, which we have termed haemorrhagic hyperprothrombinaemia (Kark and others, 1940), may be divided into two classes—latent haemorrhagic hypoprothrombinaemia and spontaneous haemorrhagic hypoprothrombinaemia.

Latent Haemorrhagic Hypoprothrombinaemia

When the patient's blood-prothrombin level has fallen to about 35% of normal, haemorrhagic manifestations occur at the sites of *obvious* trauma; bleeding starts from recent operation wounds or where the gums have been damaged by too vigorous brushing of the teeth. Below this level, too, dangerous haemorrhage occurs from intestinal ulcerations, if they are present. One physical sign especially gives evidence of the marked reduction in the blood prothrombin. In all patients in whom the prothrombin level had dropped to below 35% of normal, haematomata became evident at the site of venepuncture or where the skin had been punctured for bleeding-time estimations. *These "needle-puncture haematomata" were often the only outward clinical evidence of a dangerous tendency to bleed.*

Spontaneous Haemorrhagic Hypoprothrombinaemia

A spontaneous haemorrhagic diathesis becomes apparent when the blood-prothrombin level has fallen to from 15 to 20% of normal. This condition is seen especially in newborn infants and occasionally in patients suffering from idiopathic steatorrhoea (Kark and others, 1940), obstructive jaundice, or severe parenchymatous hepatic disease.

The condition may manifest itself by the spontaneous appearance of large haematomata on the back, thighs, or other sites of pressure. Dramatically, haemarthrosis, severe haematemesis, epistaxis, haematuria, or melaena may be the presenting symptom. Menorrhagia and intracranial and retinal haemorrhages have been noted. Intractable haemorrhage may occur from trivial skin wounds or, in infants, from the umbilical cord. Although the gums may bleed they do not show the purple sponginess characteristic of scurvy, and perifollicular haemorrhages of the skin are not a feature of this condition. Laboratory studies are striking. The blood-coagulation time is prolonged, but not to the same extent as it may be in haemophilia. No abnormalities are noted in clot retraction either in clotted whole blood or in recalcified plasma. The bleeding time, though usually normal, is occasionally prolonged.* The capillary fragility is unaltered, as is the blood-platelet count. Marked prolongation of Quick's prothrombin time is present, and is the crucial finding.

The main features of haemorrhagic hypoprothrombinaemia are as follows:

"Needle-puncture" haematomata; continued and prolonged wound haemorrhage; subcutaneous haematomata, especially at pressure points; haemarthroses, epistaxis, haematemesis, melaena, haematuria, retinal haemorrhages, menorrhagia. *No* gum changes; *no* perifollicular haemorrhages.

Laboratory Data. — Blood - prothrombin concentration markedly reduced; prolonged coagulation time; occasionally increased bleeding time; normal capillary fragility; clot retraction normal; platelets normal.

Clinical Causes of Hypoprothrombinaemia in Man

The development of hypoprothrombinaemia in man is usually associated with evidence of florid pathological disturbances of the bile ducts, intestine, or liver. Although the precise interrelationship between these organs, vitamin K, and prothrombin is not understood, the broad outlines of the physiological processes which maintain an adequate concentration of prothrombin in the blood have been clearly drawn. Experimental evidence has shown that prothrombin is formed by the liver (Smith and others, 1937; Warren and Rhoads, 1939) if an adequate supply of vitamin K is maintained. Furthermore, the presence of bile salts in the intestinal canal is necessary for the proper absorption of the naturally occurring vitamin, which is an oily substance (Greaves and Schmidt, 1937; Greaves, 1939). Prothrombin is destroyed in the body by passage through the lung (Andrus and others, 1940) and perhaps by a sustained rise in temperature (Wilson, 1939). Thus it is clear that hypoprothrombinaemia may develop as a result of a nutritional deficiency of vitamin K or following a disturbance in the formation or metabolism of prothrombin.

With this in mind the following classification of diseases in which hypoprothrombinaemia is known to occur is suggested:

NUTRITIONAL DEFICIENCY OF VITAMIN K

Restricted or Unbalanced Diet.—Scurvy; pellagra; rickets; idiopathic steatorrhoea; haemorrhagic disease of the newborn.

Defective Absorption from the Intestine.—(1) In the absence of bile salts: Obstructive jaundice; biliary fistula. (2) In the presence of intestinal disease: Regional ileitis; ulcerative colitis; intestinal obstruction; polyposis coli; idiopathic steatorrhoea; neoplasm of the intestine.

METABOLIC DISTURBANCES OF PROTHROMBIN ANABOLISM AND KATABOLISM

Failure of Production of Prothrombin by the Liver.—(1) Degenerative or infective parenchymatous processes: Acute yellow atrophy; infective hepatitis. (2) Infiltrative parenchymatous processes. Generalized carcinomatosis; leukaemia.

Diminished Production of Prothrombin by the Liver.—Chronic hepatoses (Banti's syndrome, alcoholic cirrhosis); catarrhal jaundice; leukaemia; neoplasm of the liver.

Increased Destruction of Prothrombin.—Artificial fever therapy; prolonged fever.

In many conditions hypoprothrombinaemia results from a combination of pathological disturbances. This is especially true in intestinal diseases. Here, besides absorptive difficulties, there may be loss of vitamin K, and possibly of prothrombin, by excessive vomiting, diarrhoea, or the removal of succus entericus by a Wangensteen drainage tube. To this loss may be added the restricted dietary intake

* Preliminary investigations would suggest that when this latter finding is present it may be due to coexisting scurvy.

common in these patients and destruction of prothrombin by long-continued fever. Case 1, below, illustrates such a combination of circumstances.

When ulcerative conditions of the bowel are present and hypoprothrombinaemia develops, continuous haemorrhage from the lesion will occur when the prothrombin level has decreased to about 35% of normal. This is true of ulcerative colitis and regional ileitis, and possibly explains the intestinal haemorrhage seen in enteric fever. When the mucosa is intact, however, no melaena or haematemesis will become evident until the blood-prothrombin level has dropped to the spontaneous haemorrhagic level of from 15 to 20%. Such a condition is especially common in haemorrhagic disease of the newborn and is sometimes found associated with idiopathic steatorrhoea.

Dietary deficiency *per se* rarely causes a haemorrhagic hypoprothrombinaemia (Kark and Lozner, 1939). We have, however, observed an infant with rickets of dietary origin who developed a spontaneous subarachnoid haemorrhage; the blood-prothrombin level was extremely low, being 20% of normal. The prothrombin level was rapidly restored to normal by therapy with synthetic vitamin K parenterally, and the child made an uneventful recovery following craniotomy and evacuation of the blood clot.

In idiopathic steatorrhoea, although a hypoprothrombinaemia does occur as a result of failure of intestinal absorption while a mixed diet is being taken, a haemorrhagic level is not reached unless the patient is on a low-fat diet (Kark and others, 1940). As a result of such a regime fat-soluble vitamins are markedly restricted, and within six months to two years features of spontaneous haemorrhagic hypoprothrombinaemia may appear.

Metabolic Disturbances of Prothrombin Anabolism and Katabolism

The manner in which the production and destruction of prothrombin in the body take place is not clearly understood, and for this reason any classification on the basis of metabolic disturbances of prothrombin formation or breakdown must of necessity be tentative. It has long been known that prothrombin is sensitive to heat and is readily destroyed by a temperature of 40° C. in a water-bath. Prothrombin studies were therefore made on patients undergoing artificial fever therapy. The results obtained were inconclusive. However, Wilson (1939) reported observations on a series of patients undergoing artificial fever therapy who developed a severe haemorrhagic diathesis and pronounced hypoprothrombinaemia. As yet it is not clear whether high pyrexia during the course of a disease is in itself capable of hastening the destruction of prothrombin in the blood, but it would appear that in patients with hypoprothrombinaemia a sudden high fever may accelerate the rate of destruction of prothrombin.

In newborn infants a physiological drop in prothrombin occurs after birth and, reaching a low level four or five days later, gradually returns to normal (Brinkhous and others, 1937; Waddell and Guerry, 1939). When this physiological drop becomes marked, haemorrhagic disease of the newborn develops. Castle (1939) has suggested that this condition is a nutritional disease dependent perhaps on a maternal deficiency or on the deficient synthesis of vitamin K in the newborn before the intestinal bacterial flora becomes established. While this may be true it would seem that other factors may also play a part in the production of haemorrhagic disease of the newborn through overactivity of normal physiological processes which occur after birth. Although Kugelmass and Tritsch (1929) reported low prothrombin concentrations in the blood of a mother whose infant developed haemorrhagic disease of the newborn, the test they used was not specific for prothrombin. Since the introduction of more specific tests and the consequent revival of interest in blood prothrombin concentration in the newborn no reports have been published of a diminished prothrombin level in mothers of infants suffering with haemorrhagic disease of the newborn, nor have we been able to find any reduction of the prothrombin in the mothers of babies with prothrombin deficiency whom we have studied. It is known that in premature infants the physiological reduction in the prothrombin concentration level is greater, and haemorrhagic disease of the newborn is more common, than in infants born at full term (Shettles and others, 1939; Kato and Poncher, 1940). In a premature infant the general body metabolism is much increased, and it may then perhaps be true that a severe fall in blood prothrombin in a newborn infant is an index of an abnormally raised metabolism, with a consequent increase in the normal physiological process of blood-prothrombin reduction.

Hypoprothrombinaemia and the Prognosis of Patients with Liver Disease

Since Quick and others (1935) first reported the association of hypoprothrombinaemia with various types of jaundice numerous authors (Quick, 1938; Butt and others, 1939; Scanlon and others, 1939) have noted that patients with parenchymatous disease of the liver may have a low blood prothrombin which does not respond to therapy with vitamin K and bile salts. This failure of response is due to total or partial failure of the mechanism by which prothrombin is formed. Preliminary observations (Kark and Souter, 1940) on this phenomenon have shown that patients with liver disease and hypoprothrombinaemia may be divided into two main classes: those whose liver disease is so severe and widespread that they are *totally unable* to manufacture prothrombin; and those with more chronic and less widespread liver damage who are able to manufacture *some* prothrombin. In such patients it was not possible to correct the hypoprothrombinaemia by therapy with natural and/or synthetic vitamin K, supplemented in some cases by transfusion or therapy with large amounts of liver. The first group, with severe liver disease, always developed a haemorrhagic hypoprothrombinaemia; and all the patients in this group died within a short time of their admission to hospital. The second group, who also did not respond to therapy, never developed a haemorrhagic tendency (i.e., the blood-prothrombin concentration always remained above 35%), and were eventually discharged from hospital. Further studies have confirmed these observations, and it is now believed that if a patient with liver disease develops a severe hypoprothrombinaemia (below 35%) which is *resistant* to vigorous treatment with parenteral vitamin K in large doses, then the immediate prognosis is very grave. The immediate prognosis of the second group is good, but since they have been studied only during the nine months before writing this paper it has not been possible to assess their prognosis correctly on the basis of the prothrombin level of their blood. It is likely, however, that the Quick test, used in conjunction with vitamin K therapy, may become a useful liver-function test. The following case is illustrative:

A young boy suffering from acute rheumatic fever and severe congestive failure developed an acute parenchymatous hepatitis during his illness. He was extremely ill with cholaemia, and a severe haemorrhagic tendency became evident. On clinical and laboratory evidence he was given a bad immediate prognosis. His prothrombin level at the height of his illness was found to be 24% of normal. Following injection of synthetic vitamin K the prothrombin concentration rapidly and unexpectedly increased to well above the level for haemorrhage, but

remained between 45 and 50% of normal, despite further treatment. On this basis it was felt that his immediate prognosis, notwithstanding the other observations, was good. At present, six months after the acute episode, he has a chronic hepatitis with ascites, and his prothrombin level has not yet returned to normal.

In this patient it is probable that a moderate metabolic disturbance in the manufacture of prothrombin was accompanied by a failure of absorption of vitamin K from the gut because of obstructive jaundice due to hepatic cell swelling, with subsequent pressure on the intrahepatic ducts.

Hypoprothrombinaemia and the Diagnosis of Obstructive Jaundice.—When the patient with intense jaundice and acholic stools presents a problem in differential diagnosis the *rapid* return of a lowered prothrombin concentration to a *normal* figure following the administration of adequate doses of parenteral vitamin K is strongly suggestive of obstructive jaundice.

Haemorrhagic Conditions unassociated with Hypoprothrombinaemia.—In patients with haemophilia, purpura haemorrhagica, thrombocytopenia, "idiopathic" menorrhagia, polycythaemia, and other blood dyscrasias the blood-prothrombin levels were within normal limits. When vitamin K was given to some of these patients it was, as anticipated, without effect on their haemorrhagic diatheses. In patients who had bled from peptic ulcers the blood-prothrombin level was but little reduced even when haemorrhage had been severe. This reduction in blood-prothrombin concentration paralleled the amount of prothrombin lost with the blood from the lesion, and was never severe enough to perpetuate the haemorrhage by reason of prothrombin depletion.

Treatment of Hypoprothrombinaemia

The development of synthetic analogues of vitamin K has rendered the use of natural vitamin K, together with bile salts, unnecessary. The synthetic substances are more effective, their dosage is more easily standardized, and they are less expensive to manufacture. Of the numerous known synthetic compounds with vitamin K activity, 2-methyl-1 : 4-naphthoquinone, described in detail by Ansbacher and Fernholz (1939a), is most active, and it is at least three times as potent as natural vitamin K (Ansbacher and Fernholz, 1939b). This yellow crystalline substance is only slightly water-soluble and is not easily adaptable for parenteral use.

Recently Moore and Kirchmeyer (personal communication) have synthesized a water-soluble compound, 2-methyl-1 : 4-naphthohydroquinone-3-sodium-sulphonate,* which is made up so that 1 c.cm. of an isotonic solution containing it is equivalent in vitamin K activity to 2 mg. of 2-methyl-1 : 4-naphthoquinone. This material is potent and easily administered parenterally; no toxic symptoms have been noted referable to its use in the dosage given (Kark and Souter, 1940).

Since the experience in this laboratory has been limited to the use of these two compounds and natural vitamin K no mention will be made of any of the many other synthetic analogues of vitamin K.

Parenteral Therapy

In the treatment of haemorrhage resulting from hypoprothrombinaemia the parenteral compound is most useful, and intravenous administration of the drug is most effective in checking active bleeding; a haemorrhage is controlled within one and a half to three hours after injection, while the blood-prothrombin level rises rapidly and reaches a normal level within twenty-four to forty-eight hours. A single intravenous injection, however, will not maintain a normal concentration, and the prothrombin level will fall within the succeeding twenty-four hours and may rapidly return to a level at which there is danger of haemorrhage.

A single intramuscular injection, while not so effective in the rapid control of haemorrhage, will, however, maintain a normal level of prothrombin in the blood for some days. It is therefore advisable, in a patient presenting active haemorrhage, to give both intravenous and intramuscular injections of the water-soluble compound in order that the maximum advantage of each route of administration may be utilized in raising the prothrombin concentration of the blood rapidly and in maintaining it at a high level.

When given parenterally, 1 to 3 c.cm. of the water-soluble compound (equivalent to 2 to 6 mg. of 2-methyl-1 : 4-naphthoquinone) has been found sufficient to control haemorrhagic hypoprothrombinaemia in the presence of a normal liver (see case records and Fig. 3).

In patients with hypoprothrombinaemia who are vomiting actively, or in those patients suffering from gross intestinal absorptive difficulties, one intramuscular injection of 3 c.cm. of the water-soluble compound will usually restore the prothrombin level to normal and maintain it at a high level for from four to six days.

Oral Therapy

The first clinical application of therapy with vitamin K was to treat patients suffering with disease of the biliary passage and hypoprothrombinaemia by the administration of natural or synthetic vitamin K orally in an oily vehicle together with bile salts or bile given by duodenal tube. Many of these patients developed nausea, vomiting, or diarrhoea as a result of taking the bile preparations. Preliminary investigations, however, on a few patients who had complete biliary obstruction (as evidenced by the absence of urobilinogen from their stools) and hypoprothrombinaemia have shown that 2-methyl-1 : 4-naphthoquinone when made up in tablet form is absorbed from the alimentary canal in the absence of bile salts. In these patients 2 mg. of the material given three times a day will control the hypoprothrombinaemia (see case records and Fig. 4). Smith and Owen (Moore and Kirchmeyer, personal communication) have successfully treated similar cases by administration of a water-soluble naphthol without bile salts.

In patients with nutritional deficiency or in patients with idiopathic steatorrhoea 1 mg. of 2-methyl-1 : 4-naphthoquinone given daily will usually suffice to control hypoprothrombinaemia or prevent its appearance (Kark and others, 1940).

Prophylaxis

There is good evidence to show that the prothrombin level of babies born of mothers treated with vitamin K before labour is higher than that found in babies of mothers who have not been so treated (Shettles and others, 1939). Ideally, it might be advisable to give pregnant women at least 2 mg. of 2-methyl-1 : 4-naphthoquinone daily during the last week of their pregnancy, and to feed or inject a similar dose to the baby soon after birth. If the latter therapeutic measure alone were to be adopted as a routine procedure haemorrhagic disease of the newborn would become an extremely rare condition.

It is probable that in the future vitamin K or one of its analogues will be given as a routine pre-operative measure to patients suspected of having hypoprothrombinaemia. It is proper to emphasize at this point that the administration of therapeutic doses of vitamin K or its analogues before operation is not in itself a guarantee that the blood-

* Now known as hykinone, and produced by Abbott Laboratories, N. Chicago, Ill.

prothrombin concentration will be raised to within normal limits. Indeed, in certain patients with liver disease this effect is not accomplished. For this reason it is always necessary to determine the blood-prothrombin concentration immediately before operation, even when vitamin K or one of its analogues has been given in amounts considered adequate. When the prothrombin level is found to be low in spite of such treatment, transfusion of *fresh* blood or plasma is the only known therapeutic measure which can increase the prothrombin concentration of the blood. The indiscriminate administration of vitamin K to patients showing a bleeding tendency without establishing that the condition is one of haemorrhagic hypoprothrombinaemia is to be deplored. Therapeutic failure in such cases may unjustly throw discredit on a valuable and specific remedy.

Illustrative Cases

Case 1 (*Fig. 2*).—A poorly nourished young girl aged 18 suffering with regional ileitis developed an intraperitoneal abscess after a laparotomy. Her post-operative course was extremely stormy. She had hectic fever, diarrhoea, vomiting, and mild dementia. Haemorrhage occurred from the bowel and from the abdominal wound. The blood-prothrombin concentration was markedly reduced, but treatment with 4 c.cm. of intramuscular natural vitamin K (6,000 Dam units) controlled the haemorrhage and restored the blood-prothrombin level to normal.

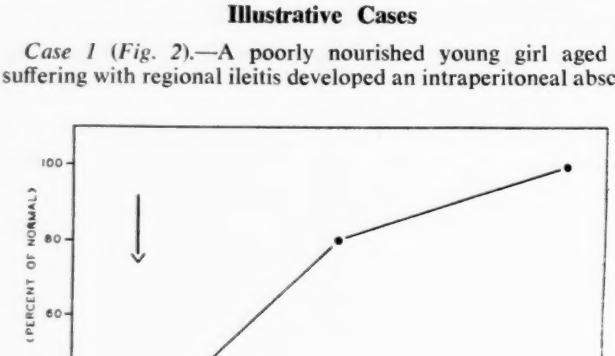

FIG. 2.—Case 1. The effect of intramuscular natural vitamin K (6,000 Dann units) on the blood-prothrombin percentage and haemorrhagic tendency of a patient with regional ileitis.

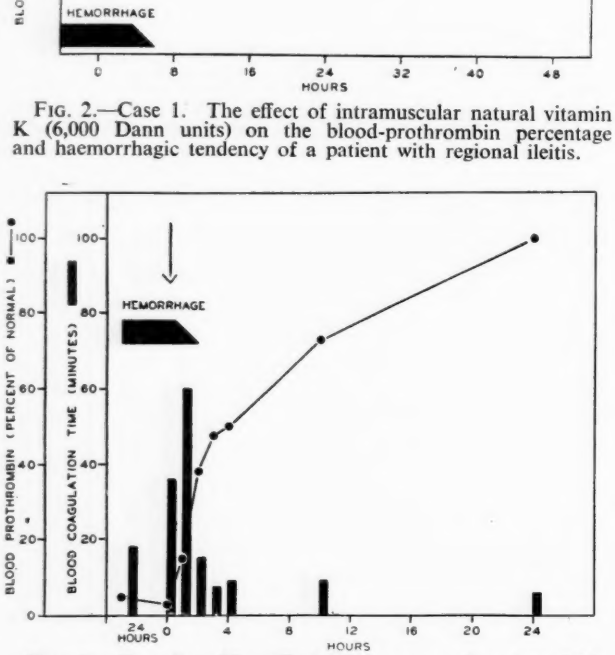

FIG. 3.—Case 2. The effect of 3 c.cm. of water-soluble vitamin K on the blood-prothrombin percentage, coagulation time, and haemorrhagic tendency of a patient with stenosis of the common bile duct. (Each cubic centimetre of water-soluble vitamin K is equivalent to 3.2 mg. of 2-methyl-1:4-naphthohydroquinone-3-sodium-sulphonate.)

Case 2 (*Fig. 3*).—A woman aged 42 suffering from traumatic stricture of the common bile duct had had recurrent attacks of obstructive jaundice for ten years. During this time she had on many occasions developed a haemorrhagic diathesis, which was uncontrolled by therapy. On her admission to hospital her blood-prothrombin concentration was less than 5% of normal and she was bleeding from her nose and gums. Intramuscular injection of 3 c.cm. of water-soluble synthetic vitamin K (equivalent to 6 mg. of 2-methyl-1:4-naphthoquinone) controlled the bleeding within one and a half hours, and the blood-prothrombin concentration returned to normal by the next day. Since this time the patient's blood-prothrombin concentration has been maintained at a high level by treatment with injections of the water-soluble compound or by the oral administration of 2-methyl-1:4-naphthoquinone.

Case 3 (*Fig. 4*).—A woman aged 73, with carcinoma of the pancreas, developed a painless obstructive jaundice which was complete. Marked bruising appeared at the site of a venepuncture and her blood-prothrombin concentration was found to be severely reduced. Oral administration of 2-methyl-1:4-naphthoquinone without the bile salts restored the prothrombin level to normal, and surgical intervention was successfully accomplished without abnormal haemorrhage. While she remained in hospital she was given 4 mg. 2-methyl-1:4-naphthoquinone each day to maintain her blood-prothrombin concentration at a high level.

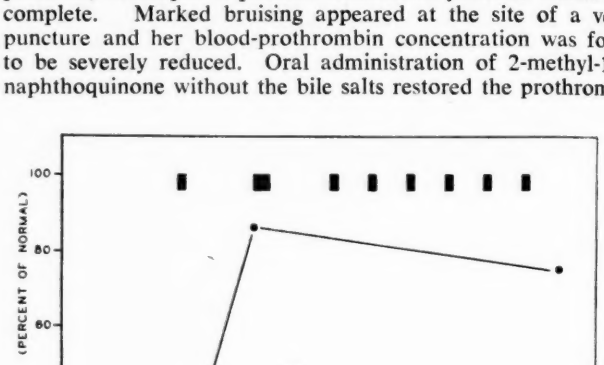

FIG. 4.—Case 3. The effect of oral administration of 2-methyl-1:4-naphthoquinone without bile salts on the blood-prothrombin percentage of a patient with carcinoma of the pancreas and obstructive jaundice. (Each small block represents 2 mg. of 2-methyl-1:4-naphthoquinone.

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RUPTURE OF THE DRUMHEAD AS A WARTIME INJURY

BY

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Rupture of the drumhead is a common peacetime injury; and when the present emergency has become a matter for clinical-statistical investigation rather than for clinical action, and more complete statistical figures are available, it might well prove the most common of all types of injury due to aerial bombardment. The frequency of rupture of the tympanic membrane under air-raid conditions is no surprise. Reports from Barcelona had suggested it, and in a recent discussion Miss J. Collier (1940) quoted R. Trueta's Barcelona figures, indicating that from 30 to 60% of the Barcelona air-raid casualties had sustained damage to the drumhead.

Rupture of the tympanic membrane in peacetime is a slight injury. But it only remains a slight injury when it is followed by an uncomplicated course, free from infection of the tympanic cavity; and there is evidence to believe that this uncomplicated course, which is the rule in peacetime injuries, is less frequent when the injury is due to the blast of high-explosive bombs. Once infection establishes itself inside the tympanic cavity the whole chain of aural afflictions and otogenic complications, ranging from slight persistent deafness to death from meningitis, is a possible outcome of the injury.

Apart from those ruptures of the tympanic membrane which are caused by the extension of a fracture of the cranial bones to the membrane, it is customary to differentiate between direct and indirect traumatic ruptures. The direct ruptures are caused by a great variety of foreign bodies and by over-powerful syringing of the meatus for the removal of wax. The indirect ruptures are due to sudden changes in the density of the air in the meatus, aided by complete blockage of the air in the meatus at the moment of the influence of the force. The most common causes of such indirect ruptures are blows on the ear, particularly the slap with the open palm occluding the meatus, and inadequate head-first dives into the water. Most textbooks include the rupture of the membrane due to explosions among the indirect ruptures, but this is wrong. The rupture is a direct one caused by the extremely powerful concussion of the air by the explosive—the "wave of pressure" (Zuckerman, 1941). All these differentiations, however, are only of theoretical interest.

From the practical point of view it is best to distinguish between ruptures which leave the tympanic cavity most probably sterile (slap on the ear), and ruptures in which the sterility of the tympanic cavity has been interfered with (syringing, diving). These two clinical types of rupture are often followed by a different clinical course. Ruptures of the drumhead caused by blast must be regarded as belonging to the second group, as it is always likely that foreign matter, carried by the blast, has entered and possibly infected the tympanic cavity.

Symptoms

Indirect ruptures of the drumhead can remain symptom-free, particularly in cases of previously reduced hearing or diminished resistance of the membrane. In air-raid casualties the symptoms are often masked by the presence of more severe injuries and, lacking routine otoscopy, such cases are in danger of being overlooked until suppuration occurs.

In most cases, however, at the moment of the rupture a short stabbing pain is felt, frequently accompanied by tinnitus or the hearing of a high-pitched sound. Initial vertigo is very common. Some pain persists for a few hours or even days. Hearing is moderately reduced. In many cases a trying feeling of fullness in the ear, occasional giddiness and sickness, headaches, and a certain amount of deafness persist for considerable periods. The vertigo, particularly that immediately following the injury, deserves a few words of explanation. It is not, as commonly suggested, caused by some "concussion of the labyrinth," but is simply explained as being the effect of cold caloric irritation, caused by cold air. The air normally contained in the tympanic cavity is warmed by its passage through the nose and Eustachian tube. Following the injury, cold air suddenly gains access to the middle ear and irritates the labyrinth. I have found in such cases that vertigo and nystagmus can be re-elicited, and the direction of the latter characteristically changed, by alternately placing a bottle filled with ice and a hot-water bottle in front of the external canal. The irritation of the labyrinth by cool air is one of the reasons for keeping the meatus closed following such an injury.

Signs

In fresh cases the most common finding on the drumhead is that of a roundish, irregular, or slit-shaped perforation, the latter usually in a radial position. The margin of the perforation is often frayed and irregular, and sometimes a flap, exposing an angular-shaped perforation, is folded towards the skin of the meatus. These "everted edges" of the perforation are not, as recently suggested, due to the "wave of suction" that follows the pressure-wave of the blast, but are quite common peacetime findings, and are described in old textbooks. A small zone around the margin of the perforation is discoloured and stained by the extravasation of blood. The remaining part of the drumhead is unchanged, but may show small interstitial haemorrhages; the latter findings are particularly common in blast injuries, in which also minute blackish spots sometimes occur, due to the impregnation into the membrane of small solid matter contained in the blast. A certain amount of blood, or coagula, in the meatus is a very common picture; and in air-raid casualties the whole of the meatus may be blackened by soot. In fresh cases the yellow colour of the normal mucous membrane of the medial tympanic wall is easily distinguished through the perforation, its yellow ("bone-yellow") colour forming a distinct contrast to the blood-stained margin of the perforation.

The perforation is more often situated in the anterior than in the posterior quadrants. Any anatomical detail of the contents of the middle-ear cavity, such as stapes, chorda tympani, or round window, can on occasion be seen through the perforation, should it happen to lie within the line of sight; and such structures will show a typical parallax phenomenon on movements of the observer's head. In cases in which there is no suspicion of a fracture to the base of the skull it might be permissible to remove carefully blood crusts, coagula, or wax by means of a sterile probe or aural forceps, should such structures render inspection of the drumhead impossible. The use of the syringe, however, is always and most strictly contraindicated.

It is usually easy, but quite unnecessary, to demonstrate the presence of the perforation by certain tests such as the Valsalva experiment, Kugel's test, or "reversed politzerization." The hearing is moderately reduced, the tuning-forks revealing a deafness of the conductive (middle-ear) type. It is advisable to test for a reduction in the perception of high sounds, and for nystagmus (other than that produced by cold caloric influence from the air), which in complicated cases reveal damage to the labyrinth.

The diagnosis presents no difficulties in a fresh case. The blood-tinged irregular margin of the perforation is quite characteristic. In cases of longer standing, however, the shape of the perforation might have already become round and regular, and the extravasated blood be resorbed. In such cases diagnosis from a pathological perforation might become exceedingly difficult unless the history helps to clear the case.

Clinical Course

Traumatic rupture of the drumhead will lead to one of the following three types of clinical course.

1. *Uncomplicated Cases.* — The perforation gradually diminishes in size, while normal drumhead tissue regenerates. Complete healing ensues, and after the regeneration of the drumhead is complete it is quite impossible to recognize any trace of the site of the previous perforation. Drumhead and hearing regain perfect normality. The average duration of the healing process of such cases is twenty-five days.

2. *Infection of the Tympanic Cavity of Low Virulence.*— Minor inflammatory reactions appear within one to three days after the trauma. There is sero-purulent discharge, lasting from a few days to several weeks. Such cases often heal with the formation of atrophic scars followed by chalk deposits in the membrane, with chronic adhesive changes (synechia) in the middle ear, or with a persistent perforation. According to these changes, the hearing capacity is permanently somewhat reduced (middle-ear deafness).

3. *Infection of the Tympanic Cavity of High Virulence.*— Major inflammatory reactions, constituting the suppurative otitis media of post-traumatic origin, appear usually not later than twelve to twenty-four hours after the injury.

There are few indications in the literature regarding the relative frequency of these different types. It is obvious that ruptures which leave the tympanic cavity sterile stand a far better chance of an uncomplicated course than those in which the sterility has been interfered with. Water is the most common source of infection in peacetime, and therefore rupture due to diving or syringing is often followed by inflammatory reactions. It is a complete fallacy to think that the routine use of sterilized water for syringing could prevent infection in cases of accidental rupture, since the meatus, with which the water has always been in contact, is never sterile. However, taking into consideration both the uninfected and the possibly infected type of rupture, a survey of a large number of cases at the Neumann Clinic several years ago left me with the impression that at least some 80% of all peacetime ruptures follow an uncomplicated course to normality of drumhead and hearing. This proportion seems to be quite different in blast injuries, as over 50% of the cases caused by air raids which I have seen showed some infection of the tympanic cavity. Admittedly I am judging from a small number of cases, but the experience of a few colleagues with whom I have discussed the matter points in the same direction. It is therefore of great importance that in all cases of rupture of the drumhead caused by blast the tympanic cavity should be regarded as presumably infected, and treated accordingly.

Treatment

The object of treatment is best expressed in T. B. Layton's words—"to get well every single case under one's care. And by 'well' I mean a dry ear, a normal drumhead, and perfect hearing." This is achieved simply enough when the tympanic cavity has remained free from infection. In such cases the treatment should be restricted to the protection of the tympanic cavity from external influences that may cause further damage. No unnecessary manipulations in the meatus should be undertaken. Syringing as well as all types of ear-drops, whether containing water, peroxide, spirit, glycerin, or any other fluid, are strictly contraindicated. It is sufficient to plug the meatus lightly with sterile ribbon gauze or cotton-wool, and to inspect once or twice a week. The patient must be advised to take great care while washing his face or taking a bath—or, in the case of a woman patient, while having her hair washed or "set"—lest water should enter the meatus. The taking of violent forms of exercise should be avoided, as sweat might accumulate in the meatus and infect the middle ear.

It is the other type of rupture, in which foreign matter has entered the tympanic cavity, that presents the problem, and, as stated above, all ruptures of the drumhead caused by blast belong to this group. Complete healing and perfect hearing are guaranteed only when the tympanic cavity remains free from inflammatory reaction. Even minor inflammatory reactions might lead to some degree of permanent deafness with all its implications, and poor results obtained during the present emergency might increase the rate of deafness among the post-war population to a very considerable degree owing to the frequency of this injury. Perfect results depend on the prevention of the trauma leading to infection. But how can a tympanic cavity contaminated by blast be protected against the occurrence of such infection?

Insufflation of Sulphanilamide.—Impressed by the frequency with which suppuration follows rupture caused by air raids, I have recently started to treat all such cases as early as possible with a preventive insufflation of powdered sulphanilamide into the tympanic cavity. My results have so far been highly satisfactory, and although fully realizing that the results of all preventive methods are particularly liable to misinterpretation, and that the experimental data at present available on the topical use of sulphonamides are not convincing, I feel satisfied that early insufflation of sulphanilamide powder into a possibly or presumably infected tympanic cavity will reduce to a minimum the number of cases of subsequent suppuration in the middle ear.

I have also tried the insufflation in cases already infected, but have failed to observe any benefit, the powder just being swept away by the discharge. And cases of acute otitis of traumatic origin should be treated by the oral administration of a sulphonamide in the same way as it is used in otitis not of traumatic origin.

Technique of Insufflation.—This is very simple so long as the ordinary forehead-mirror and not an electric auriscope is employed. The site of the perforation is focused, and a few puffs from a straight powder-insufflator, administered through the speculum under guidance of the otoscopying eye, are quite sufficient. It is necessary to look into the ear in order to make sure that the powder not only coats the walls of the meatus but actually reaches the tympanic cavity through the perforation. Afterwards the meatus is lightly plugged and the patient advised as to the protection of his external canal.

The insufflation of powder into the middle ear is so simple, the results are so promising, and the aim of preventing infection is so important that I have no hesitation in recommending it as a routine treatment for rupture of the drumhead in the present emergency. It can cause no harm whatsoever, and if tried on a large scale and found successful it will also serve as a further argument in the demand for the routine otoscopy of all air-raid casualties.

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RECOVERY FROM URAEMIA FOLLOWING CRUSH INJURY

BY

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As pointed out by Surgeon Lieut.-Commander Maitland (1941), isotonic sodium sulphate solution has been advocated as a potent diuretic from time to time. In view of the original oliguria and raised blood pressure in the case reported below it was considered unwise to give more than a pint at a time; it seems now that a larger initial dose, given slowly, might have produced more rapid results.

I have no original suggestions to make on the pathogenesis of the condition, but it is obvious from a consideration of this case and of the one reported by Mayon-White and Solandt (1941) that the syndrome is not produced by transfusion of incompatible blood and that it is not a nephritis of an ordinary type. It seems that the syndrome is the result of prolonged compression of a limb, or limbs, with subsequent release of pent-up katabolites of a toxic nature having a characteristic action on renal epithelium. While the renal lesion may be progressive up to a point, the first (fatal) case reported by Bywaters and Beall (1941), in which the affected limb was amputated on the second day, suggests that renal damage may be gross at an early stage; while the present case, together with R. V. Christie's case (quoted by Bywaters and Beall), proves that the lesion is not necessarily a fatal one. Furthermore, on superficial examination it seems that many air-raid casualties, and presumably civil accident cases, that have not been subjected to prolonged or severe crushing exhibit granular casts in their urine and have mild degrees of oliguria for variable periods. Research on these points seems to be indicated.

Case Record

A man aged 32 was admitted to hospital as an air-raid casualty on May 7, 1941. From about 1 to 9 a.m. on May 6 he had been pinned down by heavy debris across his left shoulder and

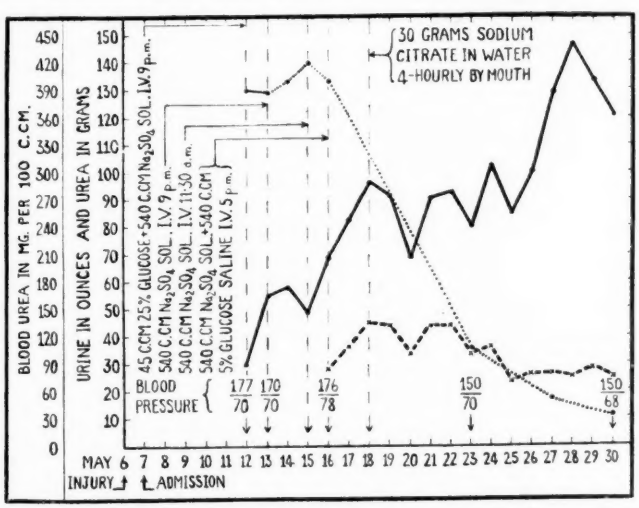
BLOOD UREA IN MG. PER 100 C.CM.
URINE IN OUNCES AND UREA IN GRAMS
30 GRAMS SODIUM CITRATE IN WATER 4-HOURLY BY MOUTH
45 C.CM 25% GLUCOSE + 540 C.CM Na2SO4 SOL. I.V. 9 p.m.
540 C.CM Na2SO4 SOL. I.V. 9 p.m.
540 C.CM Na2SO4 SOL. I.V. 11·30 a.m.
540 C.CM Na2SO4 SOL. + 540 C.CM 5% GLUCOSE SALINE I.V. 5 p.m.
BLOOD PRESSURE
177/70 170/70 176/78 150/70 150/68
MAY 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30
INJURY
ADMISSION

Chart of Case. Continuous line = output of urine in oz. per day. Thick broken line = output of urea in gm. per day. Fine dotted line = blood urea in mg. per 100 c.cm.

upper arm; he had suffered no other serious injury. He had received first-aid treatment in the neighbourhood of the air raid and had been in bed in a damaged hospital for about thirty-two hours before being transferred. No transfusions had been given.

On admission his general condition was very satisfactory. The left arm was grossly swollen and reddened, and numerous wheals were present on it. Movement at all the joints of the limb was very restricted, and there was anaesthesia from the mid-arm distally. The circulation was intact and the radial pulse palpable. The possibility of renal failure developing was considered at this point, but no prophylactic measures were taken other than to administer fluids by mouth. The arm was wrapped in cotton-wool and elevated.

On May 10 he suffered from hiccup for a short while. This became more persistent in the next forty-eight hours. The tongue was dry, for the first time, on the morning of the 12th, and despite a liberal intake of fluids the output of urine for the preceding twenty-four hours had been only 30 oz. The blood urea was 390 mg. per 100 c.cm. Active treatment was begun immediately, 40 c.cm. of 25% glucose being given intravenously, followed by 540 c.cm. of isotonic sodium sulphate solution. During the next few days the output of urine and, later, of urea was measured; the blood urea was estimated daily while intravenous sodium sulphate solution in 540-c.cm. doses was given. The clinical course is shown on the chart.

During May 12-16 the tongue remained dry and coated and the patient was restless and rather childish, though otherwise rational. On the 17th his local and general condition began to improve and thereafter continued to do so. At the beginning of June there was still some loss of power in the whole limb, but no swelling and no anaesthesia; and some hyaline and a few granular casts were present in the urine. (At the beginning of the illness there were very numerous granular casts, no hyaline casts, a few red blood cells, but no blood casts and no reaction to the guaiac test.)

The patient had never suffered from nephritis or any disease likely to predispose to it.

Summary

A case of limb-crush injury with subsequent uraemic manifestations and recovery is briefly described. A short discussion on the production of the lesion in the light of previously recorded cases is given. It is suggested that mild cases may have previously passed unnoticed and that they may result from injuries of different types.

I am grateful to Dr. W. J. Richard and Mr. A. M. Clark for permission to publish this case. I wish also to thank Dr. T. C. Ritchie for much helpful advice, and Mr. A. W. Mollison for the preparation of the various solutions used and the numerous blood and urine analyses.

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MEDICAL RESEARCH COUNCIL OF IRELAND

The Medical Research Council of Ireland has made the following awards during the half-year ended June 30, 1941. Training grants: Miss D. A. Kilbride for one year from August 1, 1941, to carry out an investigation of iodine absorption by means of Balance experiments; and Miss E. O'Donovan for one year from June 1, 1941, to assist in the investigation of the goitre problem by studying the retention of iodine under varying conditions of diet, the work in both instances to be done in the department of chemistry, University College, Cork, under the direction of Prof. J. Reilly and Dr. E. M. Mason. Whole-time grant: Dr. Cecil Mushatt for four months from March 1, 1941, to enable him to continue his research work at the Johns Hopkins Hospital, Baltimore, Maryland, U.S.A. Grants-in-aid: Dr. James Deeny for six months from July 1, 1941, to investigate the relationship of vitamin C to the formation of complement and the relationship of both to immunity; Dr. D. K. Malley to investigate the effects of the cortical hormone on a case of pre-adolescent type of adrenocortical syndrome; and Dr. J. G. Waugh towards the expenses of his research work on sulphonamide therapy in the School of Physic, Trinity College, Dublin.

The following grants have been renewed for one year: Dr. T. E. T. Bradshaw (from March 1, 1941) and Prof. Hans Sachs (from May 1, 1941). Prof. J. B. Gatenby and Dr. R. G. Cross have relinquished their grants.

ALLERGIC SHOCK FOLLOWING A SCHULTZ-CHARLTON TEST

BY

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Surgeon Lieutenant, R.N.V.R.

The following case was considered worth reporting in view of the severity of the reaction induced by a Schultz-Charlton test. A brief survey of the literature has not revealed a similar case.

Clinical History

The patient, a youth aged 18, was admitted to hospital on October 2, 1940, as a possible case of scarlet fever. His illness had begun during the previous night with generalized itching of the skin and mild nasal catarrh. On rising he had discovered a rash on his body and limbs. Slight sore throat was also complained of, but he did not feel really ill. There had been some epistaxis that morning. On examination he was found to be thin but healthy-looking; he was afebrile and his pulse was 80. Over the trunk and upper parts of the limbs, but most intense over the front of the chest, there was a rash consisting of a diffuse erythema with a suggestion of urticaria in places. The face and neck were unaffected. His tongue was clean and his throat appeared normal.

The diagnosis at this stage seemed to be urticaria rather than scarlet fever; and on inquiry the patient stated that he had eaten tinned salmon for supper the previous evening and that six weeks previously he had had a similar rash, which had cleared up in a few days. The appearance of the rash on the front of the chest did, however, suggest scarlet fever, and to exclude this a Schultz-Charlton test was done, 0.2 c.cm. of anti-scarlatinal serum being injected intradermally over the lower ribs on the left side at a point where the rash was most intense. Fifteen minutes later the patient was seized with sudden severe headache and vomiting, accompanied by a feeling of hotness and intense itching of the skin. Oedema of the face developed rapidly, so that soon his eyes were completely closed by swelling of the eyelids; simultaneously general massive urticaria appeared all over the trunk and limbs, affecting an area larger than and including the original rash. The skin was cold and clammy, the pulse rapid and thready, and the blood pressure 80/45. 5 minims of 1 in 1,000 adrenaline was injected slowly intravenously, and his blood pressure rose to 95/55, while the facial oedema diminished slightly. The urticaria subsided more slowly, and he felt weak and sleepy for some hours after the attack.

Inquiry was now made about his family and previous history. His mother, two brothers, and one sister all suffered from hay-fever. The patient himself had lived in America till the age of 12, and while there had had hay-fever every summer; after coming to this country he had no further attacks. When a child he had also suffered from sensitivity to poison ivy; he stated that contact with the plant was not necessary—urticaria resulted even at a distance of one foot. He had received inoculations for this when 13, with apparent benefit. At the age of 12 he had been inoculated against diphtheria in New York. So far as he knew these were the only occasions on which he had received injections.

October 3.—The giant urticaria had disappeared, leaving the rash much as it was on admission, although he still had some swelling of the eyelids. The site of the Schultz-Charlton test was surrounded by an intense ring of erythema, superimposed on the original rash. Generally he felt well and was afebrile, but his appetite was poor.

October 4.—The original rash was now fading and the facial oedema had disappeared. Scratch tests were performed on the left forearm as follows: pollen control, 0; pollen toxin, + after twenty-four hours. Saline control, 0; salmon protein,* slightly + in twenty-four hours, + in forty-eight hours.

October 6.—The rash had completely faded and he felt very well. Serum sensitivity tests were performed by intradermal injection on the right forearm: human serum (1:10) 0.2 c.cm., 0; horse serum (1:10) 0.2 c.cm. ++++ in five seconds. The instant local reaction to horse serum was striking; within thirty seconds there was a ring of erythema about 5 cm. in diameter and a lymphangitis in the upper arm which could actually be seen moving up towards the axilla as a thin red line, advancing about 1 cm. per second. After ten minutes the local reaction was more marked and a broad band of lymphangitis extended right up to the axilla, where the glands were tender and slightly enlarged. Blood pressure 110. The patient's face was rather flushed, but his only symptom was a mild headache. After twenty minutes the face was very flushed, and quite rapidly oedema was seen to appear round the eyes and then over the face generally, exactly as it did on the previous occasion. He complained of a pricking pain behind the eyes and his nose felt blocked. The submaxillary salivary glands were noted to be enlarged and tender. On this occasion no vomiting occurred, but he had nausea and profuse sweating. There was also a brisk epistaxis. At this point the reaction was considered unduly severe, so a tourniquet was applied above the site of injection and adrenaline was injected subcutaneously into the other arm.

October 7.—There was still severe oedema round the eyes, and the site of injection was red and swollen. He complained of some pain at this point and also across the chest, but he had slept well and felt fairly fit. Later in the day he collapsed suddenly and was unconscious for a few minutes, and his skin was cold and clammy. Recovery was rapid.

Further Progress.—During the next few days the swelling of the arm gradually subsided and was followed by the appearance of bruising at the site of injection. He had no further general symptoms, and was discharged from hospital quite fit nineteen days after admission. A notation was made on his medical history sheet of his extreme sensitivity to horse serum, in view of the probable danger of a therapeutic dose of serum.

* An extract prepared from the brand of salmon consumed by the patient.

Discussion

This patient provided an interesting example of the "allergic diathesis." He had a family history of hay-fever and was himself sensitive to the following substances: (1) Poison ivy. (2) Pollen—confirmed by skin test. (3) Salmon protein. This was probably the cause of his original rash. The onset, with itchiness of the skin, a few hours after eating a brand of salmon to which he gave a positive skin test is very suggestive. (4) Horse serum. The dramatic result which followed the intradermal injection of 0.2 c.cm. of anti-scarlatinal serum was proved to be a true sensitivity to horse serum by the exactly similar response to normal horse serum—of which 0.2 c.cm. of a 1 in 10 dilution or 0.02 c.cm. of pure horse serum induced a severe reaction. Such a high degree of sensitivity is uncommon; indeed, a similar dose of serum has been recommended as a test of sensitivity before the intravenous injection of much larger quantities.

In the human being delayed reactions to serum (e.g., serum sickness) are much commoner than immediate reactions, to which the term "allergic shock" has been applied. This term is perhaps preferable to "acute anaphylaxis," since the latter implies that the sensitivity has been induced by a previous dose of serum (Lamson, 1929). In the present case it is possible that the diphtheria prophylactic at the age of 12 was the sensitizing dose. Various estimates of the frequency of serum sensitivity after diphtheria prophylactics have been made (Hooker, 1924; Gordon and Creswell, 1929). Tuft (1932) noted that sensitivity was more common in people with a family history of allergic disease, which was certainly positive in the present case.

Cases of allergic shock after the subcutaneous or intravenous administration of serum have often been reported; but only two references have been found to general reactions to serum given intradermally. Freedman (1935) recorded the case of a boy of 6 who died after the intradermal injection of 0.05 c.cm. of horse serum given nine

days after a dose of diphtheria toxin-antitoxin. Vaughan and Pipes (1936) described a case very similar to the present one in which a severe reaction was caused by 0.1 c.cm. of anti-tetanic serum given intradermally.

An interesting feature of our case was the rapidly spreading inflammation of lymphatic vessels and glands draining the site of injection. It is obvious that such a reaction must be due to the presence of some substance flowing along the lymphatic which causes dilatation of the surrounding capillaries as it travels. Whether this substance is the actual serum injected or some tissue product is unknown, but it is interesting to realize that 0.02 c.cm. of serum intradermally can produce such an intense and prolonged lymphangitis as was observed.

Summary

A case of allergic shock after the intradermal injection of horse serum is described in a youth aged 18, who was also sensitive to poison ivy, pollen, and salmon protein.

A severe systemic reaction was induced by as little as 0.02 c.cm. of serum given intradermally.

The case emphasizes the importance of skin-testing before the therapeutic use of serum, particularly in patients with a family or personal history of allergic disease.

I have to thank Surgeon Vice-Admiral S. F. Dudley for permission to publish this case.

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Medical Memoranda

Treatment of Bacillary Dysentery (Flexner) with Sulphapyridine

In view of the increased incidence of bacillary dysentery (Flexner and Sonne) in this country during the past few months, the following note appears to be worthy of record. The results achieved are so striking that it is hoped that others who are faced with a similar epidemic may be induced to give this form of treatment a trial.

It was decided to employ sulphapyridine when bacillary dysentery showed itself at this hospital, owing to the results obtained by Drs. Reitler and Marberg published in the *British Medical Journal* of February 22 last. The opportunity occurred on April 26, when an epidemic of Flexner dysentery began. Sixteen male patients were treated, their ages varying from 22 to 67 years. They included patients suffering from various forms of chronic psychosis, and their general state of health was by no means uniformly good. Three of them had suffered from bacillary dysentery on a previous occasion.

In this hospital, unfortunately, dysentery epidemics have occurred in the past, usually in the spring and autumn, and in consequence the experience of both the medical and nursing staff in the treatment of this unpleasant illness, at least so far as it affects mental patients, is considerable. Treatment previously has been determined by symptoms and according to the current belief of the medical officer concerned. It is all the more striking therefore when experienced nurses declare spontaneously that the course of the disease has been shortened with sulphapyridine by at least seven days.

Clinically the cases were of moderate severity, with temperatures as high as 104° F. and loose stools with the usual blood and mucus. Bacteriological examination in each case uncovered Flexner XYZ. With sulphapyridine the temperature fell to normal in most cases in twenty-four hours, and in all within forty-eight. The character of the stools improved more gradually, showing diminished blood and mucus and being formed about the fifth day. In every case but one the stools were reduced to a maximum of two a day from the third day. The tongue, from being furred and dry at the outset, was clean and moist by the third or fourth day. The general condition improved in the same striking manner, the toxic appearance, characteristic of dysentery, rapidly disappearing. The drug was administered by the mouth as early as possible ; that is, immediately upon the case being clinically diagnosed. A routine dose was adopted, namely:

1.0 gramme	(two tablets)	4-hourly	for	the	1st	day
0.5	,,	(one tablet)	4	,,	,,	2nd	,,
0.5	,,	,,	,,	6	,,	,,	3rd	,,
0.5	,,	,,	,,	thrice	during	the	4th	,,
0.5	,,	,,	,,	twice	,,	,,	5th	,,

Bicarbonate of soda was added wherever there was any tendency to nausea.

Diet	1st and 2nd days	Milk and water only
	3rd and 4th days	add arrowroot
	4th and 5th days	,, ,, and mashed potatoes
	5th or 6th day	,, ,, ,, ,, ,, and pounded fish.

Bacteriologically all patients were Flexner-free (as determined by rectal swabs and plating) by the fifth day. Four consecutive negative swabs were considered to establish freedom from Flexner, and these were obtained in all the cases.

A most striking feature is the excellent general condition of the patients when they are allowed up, usually about seven days from the onset. In previous epidemics the patients have lost much weight and required several weeks of convalescence before they could be regarded as approaching normal health.

I am much indebted to Dr. Morris Robb for his careful treatment in this series of cases.

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Amidopyrine and Pernicious Anaemia

We are accustomed to associate amidopyrine with the development of agranulocytosis, but Rhoads and Miller (1937) have shown that amidopyrine will depress the production of red cells in animals on a defective diet. Their work suggests that we should be very careful about the prescription of amidopyrine, and of drugs such as the sulphonamides and the organic arsenicals, to patients with pernicious anaemia, but the following is the first case in which I have seen amidopyrine depress erythropoiesis in man.

CASE RECORD

A married woman doctor came under treatment in 1934. She was 32 years old and had suffered from symptoms of pernicious anaemia for two years. The diagnosis was confirmed by the presence of achlorhydria, increase in serum bilirubin, and a characteristic Price-Jones curve. She was in a nursing home for three months, responded well to liver injections, and became fit enough to have a baby. A week after the baby was born she began to get corneal ulcers, and eventually in 1940 she stopped the injections of liver because it seemed possible that the corneal ulcers were a symptom of sensitization to liver. In January, 1941, she lost heavily at her period and in February she resumed the liver injections. On March 20, after weekly injections, her haemoglobin was 70%, but on March 26 it had fallen to 58%. Injections of liver were given on alternate days till April 1, and then daily, but although there was a moderate reticulocytosis the haemoglobin fell to 46% on March 31 and to a minimum of 44% on April 4. The white cells were normal. Naturally some serious complication was feared, but no evidence of any could be found. Inquiry then revealed that she was taking the hypnotic drug allonal, which contains amidopyrine. On omitting this, and without making any other change in the treatment, she showed a reticulocytosis of 31% and a rapid improvement. By the end of June her haemoglobin had risen to 92% and the colour index and red cell volume had returned to normal. The tendency to corneal ulceration has unfortunately persisted.

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Reviews

ALCOHOL AND SOCIETY

Confirming the Facts: A Manual of Scientific Temperance Teaching for the Use of Teachers and Students. With a foreword by Sir George Newman. (Pp. 128. 1s. 6d.) Bedford: Rush and Warwick (Bedford), Ltd.

Confirming the Facts is a small book described on the title-page as "A comprehensive and authoritative statement concerning alcohol, its nature and effects." It has been prepared by the Temperance Collegiate Association, and is intended as a manual of scientific temperance for the use of teachers and students. Here are articles by twelve authors, each of whom is a well-known authority on the aspect of the problem with which he or she deals. For example, Sir Gowland Hopkins has written on the relation of alcoholic beverages to nutrition, the late Lord Stamp on the economic aspects of temperance, and Sir Leonard Rogers on alcohol in the Tropics. As these names indicate, the general standard of the volume is remarkably high, and the variety of the contributors results in reliable information being provided on special features of the subject.

Mr. Liverseege, former public analyst to the City of Birmingham, gives a very clear account of the composition of alcoholic drinks, and in particular explains the mysteries of calculations in terms of proof spirit. The difficulty of such estimations is indicated by the fact that the author notes a serious error in tables given in the Medical Research Council Handbook, *Alcohol : its Action on the Human Organism*. This error was due to the use of American calculations, and unfortunately the U.S.A. proof spirit differs from the British proof spirit in respect of alcohol content. Special attention is paid to the economic aspects of expenditure on alcohol. This is very wise because, while drunkenness is diminishing, the undernutrition caused by disproportionate outlay on alcohol is a problem that has become of increasing importance. Lord Stamp concluded that the working classes spent 15% of their income on alcoholic drinks, and that this consumption reduced industrial efficiency between 5 and 10%. It is usually assumed that most of the expenditure on alcohol returns to the Exchequer, but at the 1934 level of taxation the tax constituted only two-fifths of the sale price of beer. The barley and hops accounted for about 8% of the cost, while the labour cost was estimated to be about one-eighth of that created by the same expenditure in industry in general. The margin represented by cost of sale and profits is therefore substantial and explains the ability of the trade to sustain intense propaganda. Several of the contributors criticize the standards of accuracy of beer advertisements. Mr. Heath, who is secretary of the United Kingdom Alliance, makes some interesting points regarding the political activities of "the trade." The lack of enthusiasm of the Labour Party for temperance reform has been somewhat striking, and he notes that the working men's clubs have become a tremendous bulwark to protect the liquor trade. He points out the remarkable contrast between the care with which licensed premises are regulated and the lack of control of clubs.

It will be gathered that a wide variety of aspects of the alcohol problem is dealt with in this collection of papers. The more purely medical aspects are discussed by Sir Leonard Rogers, Sir William Willcox, Dr. Cove Smith, Mr. McAdam Eccles, and Prof. Amy Fleming. The Bishop of Worcester contributes an article on the Christian Ethics of Temperance. In price and size the volume resembles the Medical Research Council book on alcohol, but the scope of the two is different. The M.R.C. book deals with the action of alcohol on the human organism, whereas the book under review is more concerned with the influence of alcohol on society. Most of the propaganda for and against "the universal solvent" is so biased and inaccurate as to be distasteful to the medical profession; hence this work is of special interest because it provides a short but objective survey of different facets of an important social problem.

PSYCHOTHERAPY

Psychotherapy. By Lewellys F. Barker, M.D. (Pp. 218. 8s. 6d. net.) New York and London: D. Appleton-Century Company. 1940.

Amidst the welter of psychological and psychiatric literature which pours from the presses on both sides of the Atlantic it is refreshing to find a small book written by an experienced physician who knows how to marshal his facts and enunciate his theories with a minimum of verbiage. Dr. Barker represents the psychobiological school of Adolf Meyer, which by its breadth of outlook and catholicity of therapeutic method is wielding much influence in psychiatry and is likely to wield more and more.

There can be no set rules for the treatment of disease, and if it is of paramount importance that we should not confine ourselves to the treatment of the body only, it is equally important that we should not limit our vision to one sort of psychotherapy or to one type of mind.

The psychiatrist requires a broad basis of knowledge of all types of mental reaction and of all methods of dealing with them, but the successful practitioner will be he who knows intuitively or by experience how to choose the method which will best suit not only the patient but his own reactions in dealing with the patient. All this Dr. Barker sets out in the present essay, and if he is not impressed by the claims of the psycho-analysts, he admits that in some few cases their methods may be serviceable at least in some psychoneuroses. For the psychoses he prefers general management and occupational therapy, but points out the value to psychotherapy in many cases of irreversible "organic" disease. At the end he calls attention to the effect of various poisons in reproducing certain psychotic reactions, and suggests that the future may provide other channels to reverse these processes, but he will admit that we do not yet know whether such poisons really cause these reactions or only unmask a psychic pattern already there, nor what that pattern owes to heredity, constitution, or environment.

If this book discloses how far we are from a full psychiatric knowledge which neither this generation nor the next may achieve, it shows how steadily we are marching towards the goal, and it should be read by all who have any claim to be considered up-to-date physicians.

MIXED MEDICAL FARE

The Practitioner's Library of Medicine and Surgery. 1940 Supplement. Supervising Editor, George Blumer, M.A., M.D. (Pp. 772; illustrated. 42s. net.) New York and London: D. Appleton-Century Company.

In reviewing this book it would be unfair not to make it plain that it is a Supplement designed to bring up to date a *Practitioner's Library* which is already in existence. It must be confessed, however, that it is a large and expensive volume which provides a curiously assorted fare. Much of it will appeal to the ordinary intelligent practitioner. There is a good and detailed description of the place of the sulphonamide drugs in therapeutics. Here it is noteworthy

that the indiscriminate use of sulphanilamide in pharyngitis and tonsillitis is condemned, and it is recommended that sulphanilamide be used in pharyngitis and tonsillitis only if the infection is severe and is one that is known to respond to chemotherapy. There is also a straightforward account of recent advances in knowledge of vitamin K and the vitamin B complex. The section on infectious diseases, on the other hand, is extremely recondite. Few general readers will be particularly interested in such subjects as epulis granulomatosa, or bejel—the syphilis of Bedouin children—or toxoplasmic encephalomyelitis, and few specialists would look for information on these subjects in a volume of this kind. Among blood diseases we note very elementary articles on leukaemoid reactions and haemophilia and a fully documented article on the rare condition Letterer-Siwe's disease. The cardiological articles on the venous blood pressure and the circulation time, on the relation between thoracic deformities and cardiac disease, and on cardiac contusion are appropriate and well written, but that on granulomatous myocarditis cannot be said to be practical, topical, or informative.

Our criticisms, therefore, are directed not so much against the range of subject matter, which might be expected to be diverse owing to the unpredictable directions which the growth of knowledge takes, as against its variable depth and quality. If we are to believe the advertisements, American practitioners have a voracious appetite for medical textbooks, and the most highly specialized books are sometimes described as essential additions to their bookshelves. Nevertheless, a book addressed to practitioners should not attempt too much, and the editors must keep a tight rein on their contributors to ensure that the whole team pulls in the same direction.

HOSPITALS UNDER FIRE

Hospitals Under Fire. But the Lamp Still Burns. Edited by George C. Curnock. (Pp. 148. 7s. 6d. net.) London: George Allen and Unwin Ltd. 1941.

In this volume—a very human document of very inhuman events—the editor has collected accounts by victims and eye-witnesses of the bombing of a number of British hospitals. If the descriptions in their manner are colloquial or journalistic they also bear the stamp of authenticity. The tales have not been adorned, because they need no adornment. They are tales of nights of terror and of simple courage on the part of men and women subjected to tests of a kind for which their ordinary lives had provided no training but for which an urgent necessity, created by the worst in man, discovered in his best an adequate response. Although the descriptions are concerned mostly with the experiences of the London hospitals (the Westminster, St. Thomas's, the London, Guy's, Great Ormond Street, and the Royal Chest Hospital all receive mention), the editor is particular to explain that it was not his purpose to select, and that at the time the book was compiled many more hospitals in London and the other great cities had been or were being similarly attacked. Neither space, time, nor the censor allowed inclusion of them all. In some cases, where a decoration has led to the disclosure of a name, the accounts of personal heroism are accompanied by a personal interview and a photograph. Other actors in the drama remain anonymous. All seem to have accepted inclusion only because it might help the hospitals and the cause. Many of the facts revealed are intensely moving, and if any further evidence against totalitarian war were needed it will be found in plenty both in the letterpress and in the very fine photographic illustrations which accompany each chapter.

Notes on Books

RITCHIE CALDER'S *Carry on, London!* (English Universities Press, 5s. net) is a tribute to the ordinary people, not only in London but in all the bombed cities, who worked on through the horrors of last autumn and winter with courage that nobody would have dared to foretell. It is also to some extent a condemnation of the official mind—not so much in its direct criticisms, which are few and moderate, but in the accumulated details that show the inevitable fault of officialdom—insufficient sympathy and kindliness. It might be well for the medical profession, when it is considering reorganization, to bear in mind this lesson of how easily the human touch gets lost in regulations and in the intricacies of mass planning. In this war it is essential to keep the individual in mind, because it is so often the individual, and not a trained, disciplined soldier, who is fighting. When the war is over people will want the consideration they deserve, and Ritchie Calder's book will have served a purpose if it reminds us of this fact. At present the half-trained defence workers—the auxiliary firemen and roof spotters, the shelter marshals and wardens, first-aid parties, welfare workers—and the trained doctors and nurses too, have simply ignored red tape and done what was necessary with magnificent courage and initiative. It may be more difficult for them when the war is over, and the planners will need to be more careful not to lose sight of the people for whom they are planning. The book should be read for this reason, and also because few people will have had Ritchie Calder's opportunity for seeing so much of the picture as a whole.

The Board of Registration of Medical Auxiliaries has issued a third edition, dated May, 1941, of the Chiropodists' section of the *National Register of Medical Auxiliary Services*. It is published from B.M.A. House, Tavistock Square, W.C.1. We have also received a second edition of the much smaller Orthoptists' section of the *Register*. It will be remembered that "orthoptics" (the practice and principles of the development of binocular vision in the case of squint) was recognized by the Board on the recommendation of the Council of the British Medical Association.

A ninth edition of *Macleod's Physiology in Modern Medicine* has been published by Henry Kimpton (50s. net). The eighth edition, of which a notice appeared in our issue of April 8, 1938, was largely rewritten by a group of authors each of whom contributed a section devoted to one of the major fields of physiology. That arrangement has been continued, and the general plan and purposes of the book remain unaltered. The same contributors have co-operated in bringing out this ninth edition; they have been joined by Howard J. Curtis, who has rewritten the chapters on electrical excitation and conduction of the nerve impulse; and Walter S. Root has contributed a chapter on the urinary bladder. Although several new chapters have been added others have been combined, and the total number has not been increased.

Preparations and Appliances

ROTENONE LOTION FOR SCABIES

Rotenone lotion (British Drug Houses, Ltd.) is described as a non-oily mucilaginous preparation containing 2% of rotenone. This is the active principle of derris; it is a powerful insecticide which was used extensively in agriculture and has in recent years been tried for scabies. The vendors supply a pamphlet which gives details of the method of application of the emulsion.

The advantages claimed for rotenone are that it is not expensive, is cleaner than sulphur ointment, and is quicker to apply than benzyl benzoate. The effective treatment of scabies is a problem that unfortunately is rapidly increasing in urgency. The methods in general use are not completely satisfactory, and hence rotenone deserves a careful trial.

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THE HUMAN SEX-CHROMOSOMES

Owing to the striking peculiarities of sex-linked inheritance this mode of transmission of hereditary traits has long been known empirically in man. Thus Nasse's law described the transmission of such diseases as haemophilia, though many years had to pass before the underlying histological basis was discovered. Later still the proved existence of an X-Y human sex-chromosome pair, together with genetic and histological work on other forms, raised the possibility that the classical type of sex-linked inheritance might not be the only one. Y-borne abnormal genes, rare it is true, have been recognized in man. More recently J. B. S. Haldane,[1] deducing from observations on mammalian chromosomes the possibility of partial sex-linkage, gave a brilliant demonstration of its existence in the human subject. All types of sex-linked inheritance depend upon the simple behaviour of the sex-chromosome pair. It will be recalled that the human male and female differ in respect of this one pair out of the twenty-four. Whereas in the nucleus of the female somatic cell the two members of the pair are equal, being termed X-chromosomes, within the male nucleus is found one X-chromosome only, together with an unequal partner, termed the Y, a third the size of the X. After the reduction division, gametes are formed containing one member only of each chromosome pair. Thus all ova contain one X-chromosome, while half the spermatozoa contain an X-chromosome and half contain a Y. Should an ovum happen to be fertilized by an X-bearing sperm the result is an XX individual—that is, a female ; should it happen to be fertilized by a Y-bearing sperm the result is an XY individual—that is, a male. This is the simple basis of the determination of the sex of the new individual.

Like the other chromosomes the sex-chromosomes carry genes affecting various bodily structures and functions. In classical sex-linkage—for example, in the case of haemophilia—the gene responsible for the abnormality is exclusive to the X-chromosome. Should it be recessive, another feature of the classical case, a female bearing the abnormal gene upon one X-chromosome is outwardly normal. Half her ova will, however, contain an X-chromosome bearing the abnormal gene. Should such an ovum be fertilized by an X-bearing sperm the result will be another outwardly normal carrier female. But should that ovum be fertilized by a Y-bearing sperm the result will be an affected son, for the Y-chromosome has no corresponding normal gene to oppose the action of the single gene borne upon the X. It is equally easy to see that a haemophilic man married to a normal woman will have children who are all outwardly normal, though all daughters will in fact be carriers. This follows because to the normal X-chromosome contributed by the mother is added either a normal Y-chromosome, giving a normal son, or an X-chromosome bearing the gene for haemophilia, thus giving a carrier daughter. The female haemophiliac could appear only if a haemophilic man happened to marry a carrier woman, and this is an extremely unlikely contingency. Thus haemophiliacs are males who have received the gene from their mothers ; should they marry they transmit it in turn to their daughters, who are outwardly normal though in fact carriers.

Does the Y-chromosome carry abnormal genes? Instances have been found in other animals of genes exclusive to that chromosome and not found upon the X-chromosome. Hereditary transmission of a trait determined by such a gene is of a very simple description. The trait is exclusive to males and is never exhibited or transmitted by females. It is transmitted by an affected man to all his sons. A few rare examples of this kind of sex-linked inheritance have been discovered in the human subject. Easily the most remarkable is the " porcupine " family described by Cockayne.[2] This truly astonishing mutation has apparently been recorded once only in the history of the human race. In ordinary chromosome pairs an interchange of segments takes place before the reduction division. This has the effect of transferring a gene from the paternal chromosome to the maternal or vice versa ; the observed results are the genetic phenomena of linkage and crossing-over, which make possible the location of genes upon the chromosomes and the construction of chromosome maps. Should crossing-over take place between part of the Y-chromosome and part of the X, there should exist genes which may be located upon either chromosome and the genetic result would be partial sex-linkage, a trait so determined displaying an incomplete association with sex in contrast to the complete association characteristic of genes exclusive either to the X or to the Y chromosome. Koller and Darlington[3] having observed crossing-over between portions of the X and Y chromosomes of the rat, Haldane[4] made a search for partial sex-linkage in human records, for far more genes are known in man than in any other mammal. His search was rapidly rewarded. A fortnight's work revealed very strong evidence of partial sex-linkage in the case of three abnormalities: xeroderma pigmentosum, complete colour-blindness, and recessive retinitis pigmentosa unassociated with deafness. In three other instances there was good evidence for this mode of transmission—namely, some dominant pedigrees of retinitis pigmentosa, Oguchi's disease (a form of night-blindness), and recessive dystrophic epidermolysis bullosa.

The genetic results of partial sex-linkage can be detected only in the transmission of genes by males. The partially sex-linked gene must be situated upon an X-chromosome in the female, and crossing-over merely transfers it from one to the other without altering any ratios. A male bearing such a gene, however, carries it on his X-chromosome if he received it from his mother and on his Y-chromosome if he received it from his father. Crossing-over transfers the gene to the other chromosome, but will commonly occur in a minority of

[1] *Ann. Eugenics*, 1936, **7**, 28.

[2] *Inherited Abnormalities of the Skin and its Appendages*. London : Oxford University Press, 1933 (p. 182).

[3] *J. Genetics*, 1934, **29**, 159.

[4] *Ann. Eugenics*, 1936, **7**, 28.

cases only. Consequently a male who receives such a gene from his mother passes it on to more than 50% of his daughters and to less than 50% of his sons; this is reversed if he receives it from his father. It will be noticed that the relation to sex is not a very obvious one, and it is not surprising that the peculiarity of the genetic ratios was not observed until Haldane made his deliberate search. Since the announcement of the discovery of partial sex-linkage various workers have tested other human records, though until recently with negative results. Two more instances have now been discovered: one by Haldane[5] himself, one by other workers. Haldane has shown that recessive spastic paraplegia is transmitted in this way, and Mather and Philip[6] have found it to be true also for certain records of the transmission of hare-lip and cleft palate. Haldane in his original paper was cautious. Although he regarded the evidence as extremely strong, he stated that he "would be the last to regard incomplete sex-linkage as an established fact." No other explanation of the findings has been put forward, however, and in view also of the further supporting evidence the existence of partial sex-linkage in the human subject must be regarded as reasonably certain. Haldane has thus made the first attempt to map part of a human chromosome, though naturally, in view of the imperfections of existing records, the actual cross-over values are somewhat tentative. The unpaired portion of the X-chromosome, too, lends itself to mapping. Genes situated upon it must be linked to one another. Usually this could not be discovered, because seldom indeed would two rare genes be found in the same family group. Red-green colour-blindness is, however, a relatively common sex-linked trait and can be used as a marker. Bell and Haldane[7] have shown that the genes for colour-blindness and haemophilia are situated very close together on the X-chromosome, crossing-over between them being very rare. White[8] has shown that sex-linked night-blindness with myopia is due to a gene widely separated from that for colour-blindness. So here, too, a beginning has been made.

Apart from man, only one instance of sex-linkage has, so far as we are aware, been described in a mammal. This is the well-known black and yellow gene pair in the cat. Only a female can carry both, so, apart from a very few exceptions probably due to chromosome abnormalities, tortoiseshell cats are always females. In man, however, it would not be difficult to compile a list of forty or fifty ordinary X-borne, sex-linked genes. It may be that man differs in this respect from the laboratory and farm mammals so far studied. On the other hand it may simply be that the number of genes observed in man enormously exceeds those observed in any other mammal. It is also well known that what is apparently the same condition may not uncommonly be due to the action of any one of a number of genes, so greatly increasing the actual number likely to be observed in the human subject. It has been pointed out that the striking nature of ordinary sex-linked transmission makes it especially likely that the pedigrees will be placed on record, so magnifying the apparent proportion of such cases. There is nothing striking or unusual, however, about the pedigrees of partial sex-linkage. Do seven or eight examples discovered in a period of four years indicate that the sex-chromosomes of man are particularly rich in genes as compared with those of other mammals? --probably not, though it is clear that future work will have this and other interesting queries to answer. Undoubtedly the story of the genes of the human sex-chromosomes indicates very clearly that human genetics is far from being an unpromising field. Human material may present many difficulties, but in some respects, and particularly if records are carefully made and appropriate statistical methods employed, the human subject offers advantages shared by few other forms. In years to come the consequences, both theoretical and practical, may well be of great importance.

[5] *J. Genetics*, 1941, **41**, 141; see also *British Medical Journal*, 1941, **1**, 562.
[6] *Ann. Eugenics*, 1940, **10**, 403; see also *British Medical Journal*, 1941, **2**, 165.
[7] *Proc. roy. Soc.*, B, 1937, **123**, 119.
[8] *J. Genetics*, 1940, **40**, 403.

MENTAL DEFECTIVES IN THE ARMY

The advent of machines in modern war has not made the human factor less important. It is important in new ways as well as in the old. Courage alone is not enough. Even courage and machines together may not be enough unless care is taken to ensure that the man in the machine has the necessary aptitude for its manipulation. It is not an easy task to devise laboratory tests which will enable us to detect specific aptitudes and specific disabilities, although in peacetime much has been done, in this country mainly by the National Institute of Industrial Psychology, in the devising of vocational tests and their application to the vocational selection of employees for industrial plants. Admittedly the higher the task and the more it concerns executive action the harder it is to find appropriate tests, partly no doubt because temperamental factors, which are so much more elusive than intellectual ones, occupy a foremost place in the equipment of the successful executive. It will be remembered that in his lectures on the qualities necessary for good generalship Sir Archibald Wavell emphasized the need for "toughness." This is an example of the type of quality that is difficult to assess in the laboratory or consulting-room.

At the other end of the scale, however, the problem is notably less difficult. The last war showed well enough the danger of enlistment at random of the mentally defective. A considerable proportion of those who returned as mental casualties from their units at an early stage in their military career were found to be mentally defective persons, who at best were a danger in a negative way from their slowness of comprehension, and at worst were a positive danger from their tendency to panic. It is not difficult to eliminate the majority of such defectives, and indeed nearly all of them, by appropriate recruiting examination. Those who escape elimination at this stage can usually be detected by expert observers in the early stages of training. The saving is not only in the time spent in training such men, who learn more slowly than others and retard the training of the whole of the group to which they belong; they can also figure disproportionately on sick parade. Moreover, general mental instability often accompanies intellectual backwardness, so that disciplinary offences are disproportionately common among

defectives. An intelligence test on recruitment, by excluding the defectives, will also exclude a number of defectives and unstable people who might without it pass as normal, especially as they exhibit a glibness of speech which deceives the inexperienced.

Dr. Esher's valuable paper in the current issue of the *Journal* (p. 187) demonstrates the liabilities incurred by enlisting mental defectives, and brings out clearly the effects on the sickness rate of a unit of the inclusion of defectives. As he points out, illness is a natural refuge for them to seek. Fortunately, as Dr. Esher observes, the problem of their early detection is not solely a matter of the application of intelligence tests. The fundamental value of a good history is well shown here as in all clinical work. Inquiry into the school and work record will often reveal a state of affairs which indicates the desirability of referring such individuals for expert examination. The employment of psychiatrists at this stage of medical organization of the Services should prove a real economy in the long run, but in the absence of sufficient numbers of such specialists the question arises whether a group intelligence test should not be used as a routine in all recruits. There is good reason to suppose that a considerable proportion of defectives could be discovered in this way. Such group tests do not require for their administration the services of a highly trained specialist; intelligent personnel with some appropriate training could administer them, the assessment being left to the psychiatrists and trained psychologists. In this way not only could the militarily useless and the unstable types of defective be excluded, but the stable types of higher grade will be allocated from the beginning to the kind of work for which they are fitted. Clearly we should be as exact as we can in the employment of human material, even if our methods may seem to fall short in exactitude of the engineer's technique when he chooses material for his machines.

THE OXFORD ANAESTHETIC VAPORIZERS

For some time past the Nuffield Department of Anaesthetics has been investigating means whereby liquid anaesthetics may be administered without complicated or bulky apparatus and in known concentrations of anaesthetic vapour. The result of this work is published in four articles in the *Lancet* of July 19. In the first (Macintosh and Mendelssohn) are discussed the physical problems involved in administering the vapour of a liquid anaesthetic in any desired concentration. For example, 90 calories of energy must be furnished for every gramme of ether vaporized. In order to maintain a constant temperature of the liquid ether, heat must be supplied from an outside source at exactly the rate at which it is used in transforming the anaesthetic liquid to vapour. This is achieved by surrounding the ether container with two other containers: the intermediate one holds crystals (or "reservoir substance") which melt at a suitable temperature, and as a source of energy hot water is poured into the outside one. The heat absorbed in transforming the reservoir substance from the crystalline to the liquid state (i.e., the latent heat of fusion) provides a source of heat supply at a constant temperature—that of the melting-point of the crystals. The reservoir substance acts as a thermal buffer, taking up heat at any higher temperature but releasing it only at the temperature of its melting-point. A thermometer is placed in the intermediate container, and a sudden fall in temperature shows that the molten reservoir substance has all recrystallized; this is a sign that hot water must again be poured into the outside container.

The second paper (Epstein, Macintosh, and Mendelssohn) describes the Oxford Vaporizer No. 1, which incorporates so many striking advantages that Lord Nuffield has decided to present a thousand for distribution to the Services. Here the reservoir substance is calcium chloride, which melts at 30° C. The liquid ether is maintained at this temperature, so that there is always a constant and high concentration of ether vapour available in the container. When the patient breathes, air is drawn in through a valve. By means of a mixing tap the air can now be diverted wholly or in part over the surface of the ether or be by-passed directly to the patient, who thus receives air only. The apparatus includes a lightly spring-loaded spirometer bag which is easily worked by hand. The air thus drawn in can be used instead of the bulky cylinders of gases in common use as a *vis a tergo* to carry the anaesthetic vapour to the patient. The economy in the transport of cylinders is one of the outstanding features of this apparatus. In the third paper Cowan, Scott, and Suffolk describe the Oxford Vaporizer No. 2, in which a cylinder of liquid ether is maintained at a constant temperature above the boiling-point of ether. By means of a pin valve ether vapour is released at any desired rate. The vapour passes through and is measured by a meter which is surrounded by a reservoir substance at a temperature high enough to prevent condensation. In a mixing chamber the ether vapour mixes with oxygen and, if required, with nitrous oxide, so that any desired strength of ether vapour is delivered to the patient. In the fourth paper Pask and Epstein discuss the performance of the vaporizers. They point out that the definite smooth control which the Oxford Vaporizer No. 1 affords gives the anaesthetist confidence in supervising less experienced helpers in the administration of anaesthesia to several patients in an emergency. It also seems to make the administration of light ether narcosis easier than with any other method known. It can be used, too, for analgesia. Warm ether vapour appears to be less irritating than cold, and experiments are being continued to see whether a humidifier should be incorporated. It is pointed out that the vaporizer should be useful in the physiological laboratory, where workers will be able to correlate their clinical findings with percentages of anaesthetic vapour being administered.

FOETAL ERYTHROPOIESIS

The discovery of the liver principle by Whipple and by Minot, besides producing a cure for pernicious anaemia, served as a stimulus to the study of erythropoiesis in the adult marrow. One of the cells to which attention was directed was the megaloblast. The term served for two different types of cell. Ehrlich[1] in 1909 applied it to a cell he had seen in the blood and bone marrow in pernicious anaemia and also in the human embryo. Sabin[2] in 1921 used it for a cell in the chick embryo. Ehrlich's cell was 15 to 20 μ in size, haemoglobinated, and with an eccentrically placed finely differentiated nucleus; Sabin's had no haemoglobin but was basophilic. Turnbull[3] confined the term to the cell in the human embryo under 10 mm. long. This cell, he said, was large—about three times the size of a red cell—and was polychromatic or orthochromatic.

[1] *Die Anaemie*, by Ehrlich, P., and Lazarus, A Part I, 2nd edition, 1909. Vienna and Leipzig.
[2] *Johns Hopk. Hosp. Bull.*, 1921, **32**, 314.
Turnbull, H. M., in *The Anaemias*, by J. Vaughan, p. 20, 1936. London.

Israels[4] described the megaloblast series in human marrow from non-haemoglobinated forms to haemoglobinated types dependent upon the degree of maturity. Peabody[5] referred to a non-haemoglobinated basophilic type of cell in Addison's anaemia which was similar to the Sabin cell but pyknotic. It is unfortunate that American workers tend to apply "megaloblast" to the Sabin type of cell, whereas in Europe the Ehrlich type is meant. This confusion is due to some extent to the comparison of adult marrow types with embryonic types and not to differences between haematopoiesis in the human and haematopoiesis in the non-human. There have been few detailed studies of human foetal haematopoiesis. Knoll[6] published some work on a number of human embryos in 1929, and Gilmour[7] has recently given a full description of the development of the embryo, including many early types. For this purpose he has had access to Prof. J. E. S. Frazer's collection of embryos, including one about sixteen days old, probably slightly younger than the Peter's ovum, their lengths being up to 3 mm., 3 mm. to 12 mm., and over 12 mm. He describes the development of the cells before and after the development of the circulation and their appearance in the various foetal tissues. He finds that the haemocytoblast—first formed from yolk-sac vascular epithelium—could form all types of cell, though the particular type depended on the site. For example, in marrow every red and white cell type could come from the haemocytoblast. Erythropoiesis was never present in thymic tissue, and in embryos over 48 mm. long both erythropoiesis and leucopoiesis were entirely extravascular.

Gilmour describes two types of megaloblast—the primitive and the definitive. In embryos under 10 mm. long the haemoglobinated cell corresponded to the megaloblast of Turnbull, but after the 10 mm. stage the haemocytoblasts appearing in the liver produced a smaller type of cell. These he calls the definitive cells or family. The earlier ones, which are non-haemoglobinated and basophilic, he calls primary erythroblasts. These primary erythroblasts either may form normoblasts with pyknotic nuclei (the normoblasts acquiring haemoglobin and developing into erythrocytes), or may acquire haemoglobin very early while they still have large detailed nuclei—the cell so formed he calls a definitive megaloblast. These cells may reduce in size, the nuclei become pyknotic, and they develop into erythrocytes in due course. The definitive megaloblast is smaller than the primitive megaloblast, and has a smaller and darker staining nucleus. The two types of megaloblast seen, one after the 10 mm. stage and one before, are so different that it is a pity the term should be used in the description of both. Erythropoiesis in the foetus is more complicated than that in the adult marrow; the latter is related to the everyday work of clinical haematology. Two things seem to be indicated: first, there should be agreement between haematologists on nomenclature, and, secondly, further work is needed on foetal erythropoiesis by some method which utilizes living tissues (of the tissue culture type), so that the change from stage to stage may actually be seen taking place.

[4] *J. Path. Bact.*, 1939, **48**, 299.
[5] *Amer. J. Path.*, 1926, **2**, 487.
[6] *Z. mikr. Anat.*, 1929, **18**, 199.
[7] *J. Path. Bact.*, 1941, **52**, 25.

GARGOYLISM

The clinical picture in the bizarre combination of skeletal defects, cranial deformity, mental deficiency, splenohepatomegaly, and corneal opacification which goes under the name of gargoylism has become fairly clear from the large number of cases reported in recent years. That there is still much confusion, however, on a number of essential features is reflected in the multiplicity of names for this condition. American writers speak of Hurler's syndrome, after Gertrud Hurler, who published an account of two cases in 1919. Priority has been claimed for Hunter, who reported the condition in 1917, and a more recent claim[1] suggests that John Thomson of Edinburgh recognized it as early as 1908. Apart from eponymic designations, with their inevitable and rather futile controversies, the affection is also widely known on the Continent and in the U.S.A. under the name of dysostosis multiplex. None of the names is very happy, but more significant than the confusion in names is the confusion that prevails in the differential diagnosis from Morquio's disease. The two affections have dwarfing and a characteristic chondrodystrophy in common, and there are instances in the literature of fairly definite examples of both affections being reported under the wrong designation. In clear-cut cases the differential diagnosis presents no difficulty, for in Morquio's disease the head is normal and there is no mental deficiency. Ocular changes of an indefinite type have been reported in this disorder,[2] but the characteristic cloudiness of the cornea appears to be absent. It is also said that the skeletal anomaly is more severe in Morquio's disease than in gargoylism. But the confusion may perhaps reflect not error but a fundamental unity between the two syndromes. In the elucidation of a recently recognized syndrome only the extreme cases are studied, and it may well be that what are now regarded as two distinct affections may represent two extreme limits of a continuous one. Such a view, which appeals because of its simplicity, does, however, require evidence which is not yet forthcoming. In none of the familial groups so far reported has there been enough dissimilarity in the different members of the family to warrant anything but one diagnosis (though this may be due to the "familial stamp" so characteristic of hereditary affections). Moreover, there is pathological evidence that gargoylism is a lipoid dystrophy of the Tay-Sachs type, and there is no such evidence for Morquio's disease. It would be well if future studies on the subject were to take this possibility into account.

[1] *Arch. Dis. Child.*, 1940, **15**, 201.
[2] *Arch. Ophthal.*, Chicago, 1941, **25**, 557.

PSYCHOLOGY AND THE "HARD CORE"

One of the most difficult tasks of voluntary mental health work is to place discharged patients in suitable employment. Some of these patients, from their inability either to find work or to appreciate which work suits them, relapse and sink into depression, and return again and again for treatment. Early in 1939 the Mental After Care Association started an employment department under Miss Kathleen Laurie, a trained psychiatric social worker with knowledge of the various problems of employment, and the report[3] for the first eighteen months reflects considerable success for the experiment. Although much of the work was done during the war, 482 persons out of 666 were found employment, and some of the remainder obtained posts for themselves. Domestic service absorbed the largest number; next came clerical work and then engineering. Some good openings were found in sales departments, in needlework, and on the land, but Miss Laurie and her co-workers received more requests for workers in hospital linen rooms and on the land than they could find. Engineering was a good outlet, and the department was in close touch with a number of staff managers who were sympathetic with its aims. Of patients placed for the first time only twenty women and seven men failed—eight

[3] *Employable or Unemployable?* 1941, Mental After Care Association.

of the women with relapses; and of the total number for whom employment was found one-quarter were "very successful." Twenty-eight patients [illegible] training in various kinds of new work. Co-operation between such a department, the patient, and the employer is, of course, essential in work of this kind, and depends largely on the head of the department: the more help she can command the more successful she is likely to be. Miss Laurie sought the help of clubs, churches, and private friends in protecting the patients from loneliness and encouraging their special interests, and the co-operation of hostel wardens in finding homes offering some social life, or the necessary control for the unpunctual or the alcoholic. At times she persuaded insurance societies to pay health benefits to patients who had been unable to notify their illness at the proper time. She was on friendly terms with innumerable employment agencies. Much of her work was the tactful education of all kinds and conditions of people about the facts and effects of mental disorder and the capacity of patients to recover. It was especially difficult to bring home to them the need for speed, and official delays caused hardship. She concludes that the "hard core" of unemployment could be considerably reduced by a service of this kind on a larger scale, and that the work should be put into the hands of trained workers attached to a Government Department, the Unemployment Assistance Board, or a voluntary association subsidized and given facilities. One of the most surprising things in the report is in the foreword by Miss E. D. Vickers (until recently secretary of the Mental After Care Association), which states that this work has had to be abandoned owing to war conditions and financial stress. If any activity ought to be continued it is, surely, this successful work among one of the most expensive and useless classes of society. These persons cost millions of pounds in health and unemployment insurance and in unemployment assistance, in accommodation in mental hospitals, poor-law institutions, and prisons. Let us hope that Miss Laurie's work will be resumed and expanded at the earliest possible moment.

LANATOSIDE C (DIGILANID C)

The glucosides of *Digitalis lanata* were first used medicinally in this country a few years ago, digoxin becoming rapidly established as a valuable new drug. The chemistry of these glucosides was worked out by Stoll, and lanatoside C was found to differ considerably from the other glucosides of *Digitalis lanata* and *purpurea*. Fahr and LaDue[1] tested the therapeutic action of lanatoside C (or digilanid C) upon 256 patients with heart disease, and found that it had a rapid and efficient clinical action. Intravenous administration of 1.6 mg. reduced the heart rate to 85 or lower in fifty-two cases, the response being achieved in under two hours in thirty-eight cases. Oral administration, first of 3.75 mg., then of 2.5 mg., within twelve to twenty-four hours reduced the heart rate to less than 85 in all cases within forty-eight hours. The rate of clearance of lanatoside C, which was estimated by stopping the administration and measuring the time until the pulse rate rose above 90, varied from seven to twenty-one days, with a mean of twelve days. This approximates to the results reported by Robinson for *Digitalis purpurea*. The authors found that the drug was efficacious in the treatment of congestive heart failure with normal sinus rhythm, and would often restore rhythm in cases of supraventricular flutter. They concluded that lanatoside C was less toxic than preparations of *Digitalis purpurea*. Nausea and vomiting were rare, and when these occurred they were usually transient. This report confirms the general opinion that the clinical value of the glucosides of *Digitalis lanata* is high.

[1] *Amer. Heart J.*, 1941, **21**, 133.

CHEMISTRY OF DIARRHOEA AND VOMITING

It is increasingly recognized that the syndrome of gastro-enteritis in infants is something more than a local lesion of the alimentary tract, and that treatment to be effective must take note of the profound changes produced in the whole of the infant's tissues. Broadly speaking such changes may be summarized by the word "dehydration." In a series of fifty-one infants A. G. V. Aldridge studied the indications for giving fluid by routes other than the mouth, the best form of fluid to use, the route by which it should be given, and the value of haematological and biochemical examination in forming a decision as to the most suitable fluid to use. His paper[1] is concerned with the last but one of these. The majority of the infants were suffering from gastro-enteritis and a few from pyloric stenosis. The investigations carried out on the blood comprised red cell counts, haemoglobin estimations, haematocrit readings, and the estimation of plasma chloride and plasma protein concentrations. For these purposes very small amounts of heparinized blood (less than one-third of a cubic centimetre) were collected in specially designed tubes from the subject's heel or leg. The characteristic features of dehydration are described under three headings: clinical, haematological, and chemical. Discussing the blood findings, Aldridge notes an increased red cell count, haemoglobin concentration, and haematocrit readings indicating haemoconcentration. But there are certain special features of infancy which make the interpretation of blood investigations particularly difficult. For example, the red cell count normally alters so much during the first six months of life that reference to a special series of normals is essential. Thus a red cell count of 5.5 millions per c.mm. is normal in an infant of 4 weeks of age, but represents a fair amount of dehydration in an infant aged 3 months. With haemoglobin estimations a similar difficulty arises; some degree of hypochromic anaemia may be present, and in actual practice estimations of haemoglobin alone (so useful in adults with dehydration) gave an inadequate indication of haemoconcentration. Aldridge likewise finds that with haematocrit readings the age of the infant, and hence the normal for age, have to be taken into consideration. With this sort of special standard he found a noteworthy increase above the normal in dehydrated infants as shown by this test. For the chemical features of dehydration he studied the plasma chloride and plasma protein. For the former he found figures considerably higher than normal in infants with gastro-enteritis, but the height of the plasma chloride did not necessarily vary with the degree of dehydration or with the clinical condition of the patient. This is because there are various factors concerned with the chloride content of the blood such as loss of sodium chloride in the stools in diarrhoea and renal insufficiency leading to an accumulation of chloride radicles. In pyloric stenosis the chlorides show an almost distinctive variation owing to the loss of hydrochloric acid and sodium chloride in the vomit, so that in infants with this complaint dehydration and haemoconcentration are actually associated with a low blood chloride. Plasma chloride in gastro-enteritis was on the average a little higher than in a series of normal infants, but such a rise could not be used as an index of the state of hydration in the circulating blood. Aldridge is applying these results to the solution of other parts of his investigations—namely, what fluid to use, how to give it, and when.

[1] *Arch. Dis. Childh.*, 1941, **16**, 81.

DEATHS ON THE TABLE IN GENERAL PRACTICE

BY

JOHN ELAM, M.R.C.S., L.R.C.P.

The harrowing experience of a death on the operating table comes sooner or later to every anaesthetist, and it is to be regretted that the subject is not more freely and frankly discussed in medical literature and at medical meetings.

We must admit, I suppose, that anaesthetic deaths are avoidable and should be avoided. In the *British Journal of Anaesthesia* (1937, **14,** 55) Dr. H. Grant-White discusses how some deaths may be avoided, and he stresses particularly the need for modification in the method of inquiry into anaesthetic deaths, which would result in the collection of valuable information. The same journal in an editorial (1938, **15,** 86) suggests that the cure for anaesthetic fatalities is education and more education. We cannot, however, obtain this education unless anaesthetists will tell us about their own cases.

The following cases occurred in my own practice, and their publication will, I hope, lead to the recording of similar fatalities by others.

Illustrative Cases

Case 1.—A woman aged 32, admitted to hospital with a diagnosis of ruptured ectopic gestation. This patient was extremely ill and almost pulseless. Premedication: atropine, grain 1/100. Induction: gas-oxygen-ether; a nasal tube was then introduced into the trachea and the anaesthetic was continued with gas-and-oxygen. When the patient was being got ready for operation there was some little trouble in adjusting the table, and I assisted in getting it put right. Just at this moment the patient stopped breathing, and although oxygen was administered through the endotracheal tube and cardiac massage was adopted she died.

Case 2.—A man aged 75. Operation: removal of prostate. No premedication. I was not present in the theatre at first, because the surgeon intended to give a spinal anaesthetic himself. The patient, however, had a very marked osteo-arthritis of the spine and the needle could not be introduced. I was sent for in a hurry to administer an inhalation anaesthetic. Gas-oxygen-ether was the anaesthetic used, and all went well until the surgeon had almost removed the prostate, when the patient stopped breathing. An attempt was made to give artificial respiration, but the chest wall was absolutely rigid and artificial respiration had no effect. An endotracheal tube was introduced and oxygen given under pressure. The patient's colour did not improve, and as no pulse rate could be found cardiac massage was undertaken. After the second "squeeze" of the heart this started to beat again, and the patient's condition improved and respiration was re-established. The patient died twenty-four hours later without having regained consciousness. Post-mortem examination showed minute haemorrhages on the surface of the brain.

Case 3.—Child aged 10 with a badly crushed foot, in which gas gangrene had developed. The child was terribly ill, but at the parents' urgent request it was decided to amputate. Premedication: morphine and atropine. Anaesthetic: gas-and-oxygen. During the operation the patient's condition became worse and worse, and just as it was completed the child died.

Case 4.—Child aged 6. Intestinal obstruction—general peritonitis and appendicitis. Premedication: atropine. Anaesthetic: gas-oxygen-vinesthene. All went well until the surgeon started to stitch up the peritoneum, when the patient developed violent ether convulsions. Oxygen was administered and the patient's condition gradually improved, the convulsions passing off in about ten minutes. After the operation was completed oxygen was administered for some little time, as I feared that the convulsions might start again when the patient returned to the ward. After half an hour, as the patient's colour was good and the general condition fair, I told the porter to fetch the trolley to take the child back to the ward. Just as the trolley was brought alongside the table the patient died.

Case 5.—Child aged 4. Acute peritonitis and appendicitis. Anaesthetic: gas-oxygen-vinesthene. All went well until the surgeon introduced his hand into the abdomen. Immediately there was a violent regurgitant vomiting of the stomach contents: it was just like pouring water out of a jug. I tried to mop out the mouth and introduce an endotracheal tube, but failed completely. The patient died in a few minutes.

Case 6.—Man aged 85. Acute retention of urine. An emergency operation for the introduction of a suprapubic tube. The patient's condition was not good and I was asked to give only gas-and-oxygen. He had, however, received no premedication and the operation presented unexpected difficulties. I pushed the gas a little too far; the patient became anoxaemic and stopped breathing. An endotracheal tube was quickly introduced and oxygen given under pressure. The patient started to breathe again and the operation was completed, but he died six hours later.

Case 7.—Girl aged 15. Acute appendicitis, first seen at 3 p.m. She was the child of most difficult parents, who insisted that she must not be removed to the nursing home until the surgeon arrived. The nursing home was next door. It was impressed on the parents that no food of any kind must be given. About five o'clock, however, the girl felt better and demanded a meal. She was given a large feed of sausages, of which we were not informed. The operation took place at seven o'clock and proved to be one of exceptional difficulty. Endotracheal gas-oxygen-ether was the anaesthetic administered. Just as the surgeon was about to stitch up the peritoneum ether convulsions developed. These, however, passed off in about ten minutes, and the patient's condition improved. The endotracheal tube was withdrawn and the patient was returned to bed. She died early the next morning without recovering consciousness.

Case 8.—Boy aged 15. Multiple injuries from road accident. Anaesthetic: gas-oxygen-vinesthene. It took a long time to repair the many injuries, and the boy's condition became worse and worse. When the operation was completed he was almost pulseless, and died twenty minutes afterwards.

Discussion

Now, I think something may be learned from this series of cases. Some of these deaths might have been avoided.

In Case 1 I should never for a moment have taken my eyes off the patient. In Case 2 I think I hurried the induction too much and should have passed the endotracheal tube immediately breathing stopped instead of trying to do artificial respiration on an impossible subject. Cases 3, 4, and 8 were beyond my powers to save. In Case 5 death should have been avoided. I should have been ready for the vomiting and should have passed the endotracheal tube and washed out the stomach in the ante-room before the patient went on to the table.

Case 6 was an example of how dangerous it is to try to do too much with gas-and-oxygen. Had a little ether or vinesthene been added to these gases a successful result to the operation might have been expected. The cause of death in Case 7 was really, I think, the sausages, and is an example of what may happen when a patient is left in the care of untrained people for some hours before operation.

To ensure the proper after-care of children who have received in-patient treatment for injuries due to enemy action, the Ministry of Health is arranging for E.M.S. hospitals to notify the Medical Branch of the Board of Education (at Branksome Dene Hotel, Bournemouth) whenever it is proposed to discharge a child casualty. The Board of Education will then get in touch with the local or welfare authorities in the area to which the child is to be sent. Circular 2427 of the Ministry of Health prescribes the form of notification, and asks hospital authorities to bring these arrangements to the notice of medical superintendents and other medical officers concerned.

INCIDENCE OF VENEREAL DISEASES

Since the outbreak of war the incidence of venereal diseases has not increased to anything like the extent that was feared. At a discussion on this subject arranged by the Medical Society for the Study of Venereal Diseases on July 26 the unanimous view was that while there had been some increase it was very slight as compared with the experience of previous wars.

The figures given showed some rise in the number of early cases of syphilis; the figures for gonorrhoea are more difficult to assess. Statistics given by the medical officer of one clinic, while they showed an increase in syphilis, showed a decrease in gonorrhoea, but the latter he attributed to the fact that many more cases of gonorrhoea are now treated outside the clinic by general practitioners. With regard to the Army, of course, it would be fallacious to compare pre-war ratios with those obtaining to-day. The pre-war Army was a professional one, consisting almost entirely of young unmarried men, whereas we have now a citizen Army which includes large numbers of men of middle age and married men, and the outlook would be depressing indeed if the incidence in the Army to-day were not much lower than in peacetime. One Army medical officer said that he thought the more favourable position was due, first, to the lower incidence of venereal diseases in the civil population, thanks to the work of the clinics; secondly, to the greater effectiveness of modern remedies; and, thirdly, to the fact that the present-day soldier is less promiscuous than his predecessors—not that he is more continent but that he distributes his favours less widely. This officer said that a very small proportion of Army infections—6%—were due to professional prostitutes, 80% to amateurs, and that the rather surprising proportion of 14% were marital in origin. A naval medical officer stated that naval ratings were now well instructed in venereal diseases, and the sailor who exposed himself recklessly under the influence of alcohol was rare. In most cases the pros and cons had been carefully thought out, and any subsequent venereal infection came as a surprise: it was due to misplaced confidence in the female partner. This officer said that over 90% of the naval cases were traceable to amateurs; in one port only 3% were traced to professional prostitutes.

Women's Services and Reception Areas

The ratio of gonorrhoea to syphilis in the Army was given as round about 8 to 1; one officer of the Royal Air Force mentioned a figure of 13 to 1. All the speakers agreed that in the women's Services the incidence of venereal diseases was negligible. A medical officer of the W.R.N.S. said that only half a dozen infections had been discovered in a personnel of 16,000. A woman medical officer of a clinic in Hertfordshire said that during the eighteen months that the clinic had been opened there had been only three women Service patients. This officer went on to say that it had been anticipated that among the evacuees from London invading Hertfordshire there might be a good deal of infection, but in fact such cases among the evacuees had been very rare, and the infections which had to be dealt with were among the native population, where there were a good many cases of old neglected syphilis, either acquired or congenital, with a few recent infections. A number of wives of Service men also came to the clinic—unsophisticated women in great distress—because their husbands, on the instruction of the regimental medical officers, had written to them saying that they (the husbands) had been discovered to be infected, and advising the wives to undergo examination. This woman officer strongly protested against leave being given to Service men while they were under treatment or observation for acute gonorrhoea. On the other hand, an R.A.F. officer urged that curtailment of leave after venereal disease had been contracted would lead to concealment, and that, having regard to the efficacy of modern treatment, the case which was in an infectious stage when it left the Service clinic was so rare that it might for practical purposes be discounted.

Control of Prostitution

Colonel L. W. Harrison, who presided over the discussion and opened it, said that a suggestion had been made that owing to the largely urban distribution of clinics many rural cases must go untreated. If that had been so, however, syphilis would have become common in rural areas, but although those areas had now been infiltrated with Service personnel and evacuated people there was no indication whatever that they had been found to be rife with venereal disease. He gave some figures showing the incidence in England and Wales which indicated that although there had been some wartime increase the incidence was lower than it was seven years ago, and there was nothing like the position, present or prospective, which obtained in 1920.

The chief point of controversy at the meeting concerned the advisability of compulsory measures against the recalcitrant contact. A woman medical officer said that some low-class amateur prostitutes still seemed to flourish, and she urged that in wartime the activities of such antisocial persons should be forcibly restricted. It appeared, indeed, to be the majority feeling at the meeting that some measure of control was called for, but the meeting was reminded of the unfortunate experience of the last war in this respect, of the probable public outcry if there was discrimination against the female partner, and of the dangers of malicious accusation and the like, and there was not a near enough approach to unanimity to make it seem advisable to send a resolution to the Government.

AWARDS FOR GALLANTRY IN CIVIL DEFENCE

The award of the M.B.E. (Civil Division) to Dr. ISOBEL ORD MACALISTER, Civil Defence Medical Service, Wallasey, and the George Medal to Dr. PERCY GILBERT HORSBURGH, First Aid Area Commandant, A.R.P. Casualty Service, Nuneaton, is announced in a *Supplement* to the *London Gazette* dated July 25. The announcements read as follows:

Dr. MACALISTER: "During an air raid high-explosive bombs were dropped close to a first-aid post to which a large number of casualties had been brought in for treatment. Severe damage was caused, and the supplies of electricity, gas, and water were cut off. Dr. MacAlister was flung bodily across the ward by blast from the explosion. Broken glass and debris littered the floor and the building was in darkness. Dr. MacAlister, although herself injured, was not deterred from her work and, by the light of hand torches, she continued to attend to the wounded in a cool and collected manner. During this time bombs were falling near by. Dr. MacAlister's courage was an inspiration to the staff of the post and encouraged them to carry out their duties during the night."

Dr. HORSBURGH: "Throughout an air raid Dr. Horsburgh, with complete disregard of his personal safety, engaged in the rescue of persons trapped in the debris of bombed buildings and in giving medical attention to the wounded. He personally sought out and reported many of the incidents and procured the necessary assistance from the rescue and casualty services. On one occasion Dr. Horsburgh personally conducted rescue operations and crawled through the ruins of houses to rescue three people from the debris. He also succeeded, with assistance, in recovering alive a man who had been buried for more than twelve hours. Dr. Horsburgh's work was carried out in circumstances of great and continuous danger from high-explosive bombs and damaged buildings, and his gallantry and devotion to duty were an inspiration to the personnel of the local civil defence services."

T. H. Tomlinson, jun. (*Publ. Hlth. Rep.*, Wash., 1941, **56**, 1073), records an outbreak of psittacosis among birds in the National Zoological Park at Washington, D.C., in January and February, 1941. Fifteen birds positive for psittacosis were discovered among sixty dying or killed during the epizootic. These consisted of twelve parrots, both South American and African, one finch, and two African doves. Two of the eight bird-house employees developed clinical psittacosis and recovered. No cases were reported among the general population.

Correspondence

Depressive States in the Soldier

SIR,—I have read with interest Captain R. F. Tredgold's article (July 26, p. 109) upon depressive states in the soldier. It appears that such reactions may prove to be the most typical psychological disturbance of this war, just as the anxiety hysterias were of the last. If this is so, we may gain valuable information concerning the exogenesis of depression. I myself am not in a position effectively to speculate about the different psychological reactions to the two wars, but it would seem plausible that the lack of any real possibility of retreat from the front line to safety in this war may be an important factor.

It seemed to me unfortunate that in a clinical study of depression of the type here described the old bogy of the neurosis-versus-psychosis argument should have been allowed to occupy so much space. This argument as it is generally formulated is particularly sterile and time-wasting, leading as it does away from the accurate study of the individual case towards what Meyer has termed "the arch sin of modern psychiatry—that is, blinding oneself to the specific facts of the case at hand by asking at once, 'Is it a major psychosis?'" I do not think that Captain Tredgold has fallen into this error in his own clinical presentation, but in making reference to a recent paper of mine (*J. ment. Sci.*, July, 1940) he attributes to me, directly or by inference, views which I emphatically do not hold. Thus he suggests that I make a sharp distinction based upon one criterion between neurosis and psychosis, each again subdivided into anxiety and depressive states. He goes on to state that its use (that is, of such a distinction) was justified (by the authorities quoted, including myself) in that it indicated also a complete distinction of treatment and prognosis. In the paper under review I put forward the view that a distinction between psychosis and neurosis based upon the relationship with external reality of the patient's symptoms was useful and valid. I expressly stated that such a distinction could not provide a sharp dividing-line between neurosis and psychosis, and that differences in treatment, though important, could be exaggerated. Lastly, I mentioned my inability to differentiate between anxiety and depressive states.

In my opinion much of the controversy which has arisen over this matter has been due to the adoption of an absolutist standpoint by one or other party. It is as wrong to assume a sharp cleavage between the two conditions as it is to deny the distinction altogether. Seldom in human biology are such clear-cut differentiations to be found, but this is the poorest possible argument for the abandonment of the conception of the affective neurosis. There is a world of practical difference between the normal individual who is mourning the death of a close relative and the manic-depressive in his fifth or sixth attack of depression, the aetiological factors of which may escape a careful psychiatric history taking. Yet a graded series of cases could certainly be produced running from one end of the scale to the other: from what one may term the normal through the neurotic to the psychotic. At one point in the series it would be possible to say, "This patient's mood change is related in an orderly manner to the logical problems of his environment"; at another point this would no longer be true: between the two would be found cases where a differentiation would be a waste of time.

To a psycho-analyst, perhaps to a biochemist, searching the cases for some special facts the whole grading might be irrelevant, but to the clinician it remains of great practical importance. I do not think that Captain Tredgold's paper, concerned as it is with the admissions to a hospital for psychotics, throws much light upon this particular problem.—I am, etc.,

C. H. ROGERSON,
Medical Director.

Cassel Hospital, July 30.

SIR,—Captain R. F. Tredgold's topical paper (July 26, p. 109) stirs up interesting questions which merit thrashing out.

1. Does a psychosis differ in any essential feature from a psychoneurosis, and, if so, in what? Those who have had experience in closely studying mentally afflicted patients are, I think, mostly agreed that there is no hard-and-fast line between the two disorders, but I would suggest that a factor of crucial importance running through the series is the degree and type of "insight" present at any given moment. The psychotic individual has no insight of either type. Once he acquires intellectual insight he, although possibly disordered in mind (a borderline case, perhaps), is not insane. Intellectual insight, however, is not enough, and a patient only recedes from the borderline in proportion as he gains "affective" insight. In the early stages of the process he is a psychoneurotic, but approaches more and more to that scientific abstraction which we call "the normal" as his affective insight increases.

2. It would seem a truism to say, as does Captain Tredgold, that "any state of depression is the result of the interaction of external factors upon a personality." Often, however, the so-called external factors are fictitious. A man most dreads what he imagines may happen, not what actually has happened or is happening. Of course, as an external world does exist, some scapegoat can always be found therein to carry what Captain Tredgold labels "external factors."

3. As regards treatment by "prolonged narcosis," this has come to seem to the writer, whose experience recently has been so largely with those neurotics who resort to alcohol, to be nothing other than the medical equivalent of a good "bout." As argued in a paper entitled "Paraldehyde Addiction" (*Brit. J. Ineb.*, 1934, **31**, No. 3), many alcoholists resort to paraldehyde in an attempt to cure alcoholism, which itself resulted from an attempt to cure depression. Truly we can learn from our patients. We might learn what to avoid as well as when to copy. "Bouts" of narcotic substances are not good for shirking neurotics, who have in all probability self-administered that sort of medicine before ever they had to see a doctor.—I am, etc.,

A. E. CARVER.

Caldecote, July 27.

Functional Dyspepsia

SIR,—In his paper on the incidence of dyspepsia in a military hospital (July 19, p. 78) Major J. H. Hutchison remarks upon the low incidence of neurosis in his cases as contrasted with the "remarkably high proportion" of cases quoted by Saffley (11.2%). He then mentions that in his in-patient group there were 28.4%, and in his out-patient group 43.6%, of cases classifiable as functional dyspepsia, the chief cause of which he concludes to be worry and anxiety, although he does not regard these men as cases of anxiety neurosis.

Attention is not drawn, however, to the fact that in Saffley's group the diagnosis of anxiety neurosis was made by psychiatrists, to whom the majority of cases showing no radiological abnormality were sent. Thus most of Major Hutchison's groups of functional dyspepsias should have been investigated psychiatrically for a valid comparison; and, from what he states, a high proportion of these soldiers would have been labelled "anxiety neurotics" by a psychiatrist. He makes the diagnosis of psychoneurosis in a few cases showing gross emotional disturbances—quite uncommon features of the average anxiety neurosis—then rejects the diagnosis of anxiety neurosis in the functional dyspepsia groups because there was an "adequate cause" for their worry, which was not of "pathological intensity."

There is surely some confusion here. The "adequate causes" are factors operating on all soldiers, so there arises the problem of the predisposing factor. Major Hutchison answers this by introducing the vague concept of an "autonomic nervous system which is constitutionally somewhat precariously balanced." But is this unsatisfactory explanation necessary? Men who worry to such a degree as to produce dyspepsia "over the fate of relatives in bombed areas or in the unfamiliar surroundings produced by evacuation, or over the uncertainty of future movements," are obviously prone to abnormal anxiety. The author does not appear to have investigated the previous psychological histories of these men. Consequently he misses what, from our experience, would have been their outstanding feature—namely, that they are chronic worriers, or, in other words, anxiety neurotics. Naturally more anxiety is aroused when the external situation is more exacting, but the essential point is that the predisposition is a personality factor which can be understood in psychological terms.

Functional dyspepsia is thus a manifestation of an anxiety neurosis since it is a functional nervous condition produced by anxiety—and anxiety neurosis seems to us a preferable term since it indicates the aetiology and treatment.—We are, etc.,

H. S. GAUSSEN.
July 26. J. D. SUTHERLAND.

Hyperventilation Tetany in Tropical Climates

SIR,—Surgeon Lieutenant-Commander Forbes Guild's letter (July 26, p. 138) serves the very useful purpose of emphasizing the commonness of "fireman's cramp" under certain conditions of high temperature. There is, however, a clear differentiation between cramp and tetany. The experimental work which I quoted in my short paper showed that true tetany has been produced as a result of prolonged exposure to a high temperature in a hot bath. The conditions in a hot bath are simulated in nature only when a high temperature coincides with a high humidity, and it is in such conditions that the accessory cooling mechanism of over-breathing is called into action. Even when the required conditions prevail, only those persons who are sensitive to hyperventilation will develop tetany. The sensitivity of my patient was proved beyond all doubt.

"Fireman's cramp" can affect anyone who perspires freely over a long period, and, so far as I am aware, does not depend upon any personal idiosyncrasy. My patient, who was a very intelligent man, was quite certain that the tetany produced by over-breathing was identical in every respect with the attacks which he had had in tropical climates. I feel confident that a proportion of the cases which are loosely called "fireman's cramp" are, in fact, manifestations of tetany.—I am, etc.,

London, W.1, July 29. ALEC WINGFIELD.

Anatomical Nomenclature

SIR,—Anatomy is the foundation of medicine. Each of us should have a profound knowledge of it. The memorizing of thousands of names of structures, as well as remembering their relative positions, throws a great strain upon memory and imagination even when each structure has one name. The *old nomenclature*, exclusively used before 1895, was heterogeneous, as it included the names of anatomists, surgeons, and mythological characters.

In 1895 the *Basle Nomina Anatomica*—an attempt to improve the old nomenclature—was published. This contained a great many new names, replacing names in the old nomenclature. Many of these new names were better than the old names; many others, however, had no advantage over the old ones; while still others were definitely worse. The effect of the publication of the Basle nomenclature upon the teaching of anatomy in this country was appalling. Most universities and medical schools taught the old nomenclature, and many of them still do so; others taught the Basle names; and most doctors had some knowledge of the Basle names, but kept to the old nomenclature. In 1909 *Gray's Anatomy* adopted the Basle names, and after this some books on surgical anatomy and anatomy were written in the old nomenclature with the Basle names in brackets; while a few were written in the Basle nomenclature with the old nomenclature in brackets. Thomson and Miles's *Manual of Surgery* adopted the Basle names, but nearly all surgical books were, and still are, written in the old nomenclature.

This unsatisfactory state of things continued till 1933, when the Anatomical Society of Great Britain and Ireland published the *Revised Basle Nomina Anatomica*, or Birmingham notation. This retains the best names in the two previous notations, while all the new names have been chosen carefully and are generally self-explanatory. It is a simple matter for anyone knowing the old notation to master the Birmingham notation.

It is an encouraging fact that the last edition of *Gray's Anatomy, Descriptive and Applied*, and of Cunningham's *Textbook of Anatomy* are written in the Birmingham notation with the Basle names in brackets.

If a small book containing the old nomenclature, the Basle nomenclature, and the Birmingham notation were sent to every medical man, and if the Birmingham notation were taught in all universities and medical schools, the present intolerable muddle would end in a year or two. At the present time a student buying the newest books on surgery, anatomy, and surgical anatomy will probably get *The Operations of Surgery*, 1937, by Rowlands and Turner, written in the old notation; Cunningham's or Gray's textbook of anatomy, 1937 and 1938 respectively, both written in the Birmingham notation; and Callander's *Surgical Anatomy*, 1939, written in the Basle nomenclature. In studying hernia he will read of the external and internal abdominal rings and of Gimbernat's ligament in the surgical book; the anatomy book will describe carefully the superficial inguinal ring, the deep inguinal ring, and the pectineal part of the inguinal ligament; and, to help him still further, the surgical anatomy book will call the same structures the subcutaneous inguinal ring, the abdominal inguinal ring, and the lacunar ligament. This sort of thing continues right through each book. These are most excellent books: if the surgical and surgical anatomy ones were written in the Birmingham notation, as Gray's and Cunningham's textbooks are, it would be a pleasure to read them, making one supplement the other. As it is, it is maddening even with the help of bracketed words.

If the Birmingham notation were alone used thousands of useless names of structures would be discarded, and every student of anatomy would get rid of a heavy incubus.—I am, etc.,

Bridgwater, Somerset, July 17. JOHN H. AYTOUN, M.D., C.M.

Insulin and Diabetic Coma

SIR,—On the subject of diabetic coma Dr. Leslie Cole (July 26, p. 137) states: "With regard to insulin dosage it is very difficult to lay down rules and perhaps it is unwise to try." The following was worked out at the Montreal General Hospital, and when it was explained to me they added that it was fool-proof. The degree of coma varies from mild to profound—in profound there would not be the slightest response to a pin-prick.

The plain insulin is given intravenously, immediately followed by the same amount subcutaneously, and that in turn followed by double the amount of the protamine-zinc-insulin subcutaneously. The result of the intravenous insulin is that the patient snaps out of the coma. The subcutaneous insulin comes into play a little later, while the protamine-zinc-insulin comes into action still later and has a prolonged action. The second half of this treatment follows when the patient comes to; it consists of 20 grammes of carbohydrate every thirty minutes in the form of orange juice. In practice it simply meant that the patient had the juice of two oranges with 2 oz. of sugar every thirty minutes. A pitcher of orange juice was made up and the patient took the required amount every half-hour for a day or two until his diet and insulin were worked out. Since oranges are unobtainable the 20 grammes of carbohydrate every thirty minutes could be made up of something else, but from the results shown me I would suggest the method be given a trial.

Degree of Coma	Plain Insulin		Protamine-zinc-Insulin: Subcutaneous
	Intravenous	Subcutaneous	
Mild	25 units	25 units	50 units
Moderate ..	50 ,,	50 ,,	100 ,,
Severe	75 ,,	75 ,,	150 ,,
Profound ..	100 ,,	100 ,,	200 ,,

—I am, etc.,

Clapham, S.W.4, July 26. A. P. MAGONET, M.D., C.M.

Brucella abortus Infection responds to Sulphapyridine

SIR,—When a person is infected with *Brucella abortus* he is condemned, as a rule, to a prolonged illness which may not be diagnosed for some time and for which there has been no specific treatment. The subject of this note has been more fortunate than the average, and the case demonstrated the potency of our newest bactericide.

An enthusiastic Home Guard aged 42 took part in a prolonged exercise on Sunday, July 6; the sun was very hot and he had no protection but a "footling forage cap." On that evening he had a headache, fever, and was sick. When he was seen the following day it was decided that he had "sun fever," and was kept in bed on a liquid diet, with salicylates for relief of headache. After a week in bed his headaches had subsided suffi-

ciently to allow him to read; during the greater part of the day he was comfortable, but by 7 p.m. (new Summer Time) he was very feverish and miserable. During each night he sweated profusely and drenched his bed-clothes; by morning he was subnormal and fairly comfortable.

On July 16 he was running an evening temperature of 103° F., dropping to 98° F. by morning; he was constipated, but otherwise felt moderately well. A statement that he felt rather as he had done when he suffered from paratyphoid B in France during 1918 led me to take his blood for agglutination tests. At the same time he was given sulphapyridine, a total of six grammes being given within forty-eight hours. His temperature came down and remained down. On July 18 the report came back that his serum agglutinated *Br. abortus* (Bang) in a dilution of 1 in 500. On July 28 he is well and free from fever.

On inquiries being made into possible sources of infection the patient said that he never drank a glass of milk, which he took in his tea and, occasionally, with cereals. His milk came in a bottle labelled "pasteurized" from a good dairy. If this patient's response to sulphapyridine is not a mere coincidence we may congratulate ourselves upon having one more target for our new weapon.

My thanks are due to Dr. Cooper of the Dorset County Laboratory for the tests of agglutination of the patient's serum. —I am, etc.,

Sherborne, July 28. J. WHITTINGDALE.

Communal Feeding in Schools

SIR,—The very interesting article by a correspondent on communal feeding in schools (July 26, p. 133) revives an old controversy which is now of national importance. Under the stress of war conditions school feeding has become a general necessity, and all would agree that it should be made an opportunity for teaching the value of good cooking, the wise selection of foods, and a civilized manner of life. But I hope the medical profession will think twice before supporting a demand for communal meals as a normal thing for all children *in peacetime*. It is a very old tradition that regards the taking of meals together as a strong binding element in family life. It is right and natural that husband and children should look to the mother as the dispenser of food, who satisfies hunger, and provides welcome "treats" on festive occasions. Probably more family discipline and parental authority depend on this than is commonly supposed. In discussing this matter over many years with working-class parents I have often heard this view put forward.

Your correspondent evidently feels that the working-class woman is incapable of providing or even learning to provide healthy and wholesome food for her children. I do not believe this is true to-day, as the good health and physique of the nation show. Working-class women do in fact manage to rear sturdy families under conditions which would defeat many school doctors. Surely our aim should be to help her in this task, and not to take it out of her hands, as would certainly be the ultimate effect of your correspondent's proposals. Man does not live by vitamins alone. I would rather see a nation of children brought up to take their food at humble tables presided over by "dad" and "mum" than a nation reared on balanced meals in "refaned" restaurants.—I am, etc.,

July 29. LETITIA FAIRFIELD.

Thirst at Sea

SIR,—The annotation on thirst at sea (July 26, p. 126) interested me greatly in view of my use of hypertonic salines by the bowel in cholera, although only up to a strength of 1.2%—less than half that of sea-water—and in quantities of 10 to 20 oz. every four hours during collapse. I certainly never saw any harm from it. Although in such a disease as cholera it was not possible to say if it had any effect on the loss of fluid from the bowel, I have no doubt much of the fluid was absorbed. Later, in view of the uncertainty whether any of the salt was absorbed, I only advised the use of an isotonic alkaline saline by the rectum, and a hypertonic one intravenously. I note, however, that Martindale's *Extra Pharmacopoeia* (18th edition, p. 745) advises artificial sea-water containing 2.7% sodium chloride as an enema without any reference being given. Experiments appear to be required to decide if rectal injections of salt water permit of water being absorbed into the system.

I would also suggest an inquiry to determine if the chlorides could be precipitated from sea-water by silver nitrate, or other chemical that will leave a potable fluid after filtering off the precipitated silver salt. If so, the required apparatus might be supplied packed for fixing into ships' boats. Silver salts are expensive, but the precipitates might be saved. Doubtless the Medical Research Council can arrange for an early investigation of these suggestions.—I am, etc.,

London, Aug. 1. LEONARD ROGERS.

SIR,—Pending a decision, probably unfavourable, on the question of the benefits of the rectal injection of sea-water, would it not be advantageous to determine to what extent fresh water can be diluted with sea water before becoming undrinkable? Since normal saline solution, isotonic with body fluids, contains approximately 1% of sodium chloride, and sea-water about 3%, this suggests that a mixture of two parts of fresh water to one of salt water should be possible. If this were so, then what small supplies of fresh water were available could be eked out considerably. In addition, as is well known, a slightly salted water is, in cases where loss by perspiration is heavy, a better drink than fresh.—I am, etc.,

Chester, July 29. V. BISKE.

Sulphapyridine in Suppurative Otitis Media

SIR,—I have been much interested in the article by Dr. J. B. Jessiman (March 15, p. 399) on the use of sulphapyridine in suppurative otitis media, and think that the following cases may be of interest in this respect.

An Arab girl aged 12 was admitted to hospital suffering from right lobar pneumonia. She had previously attended for over seven years at irregular intervals with a chronic otitis media, with mastoid involvement, for which a cortical mastoid operation had been performed at the age of about 7. In spite of this an obstinate aural discharge continued, with periodical exacerbations, and no apparent response to local and general treatment. On admission she was extremely ill, with high pyrexia and typical chest signs. There was also purulent aural discharge. She was at once put on to sulphapyridine and local aural treatment; the response was immediate and the child made a rapid and uninterrupted recovery. There was still some discharge from the ear when she left hospital, and she was instructed to attend for treatment. This she failed to do, and was lost sight of for a year, after which she returned to hospital as escort to a friend. She stated that since her discharge from hospital the ear had been dry. On examination a normal passage free from pus and a scarred and sclerosed drum were found. Unfortunately smears of aural discharge were not taken on her admission, all attention being concentrated on her chest condition, but there seems very little doubt that the sulphapyridine given for this was the determining factor in clearing up this previously resistant trouble.

Following this two cases of frank otitis media were treated as follows: (1) Indian boy aged 8 months, twenty-four hours' history of fretfulness and pain in the ear. Temperature 101° F., drum of the left ear inflamed and bulging. Sulphapyridine 1/4 tablet given four-hourly and local treatment; twenty-four hours later there was no pain or fever, the child had slept well, and the drum, though still slightly injected, was no longer bulging. In three days the child was well. (2) Arab child aged 2 years had had a very septic mouth, with gross dental caries, and necrosis of a large part of the left maxilla, which was removed as a sequestrum at operation. One month later he developed left otitis media, but did not attend hospital until there had been a purulent aural discharge for several days. Local treatment was given with sulphapyridine by the mouth. The condition cleared completely in one week.

I should like, in this connexion, to note that in practically all cases of otitis media in children I have found a positive malarial blood film. I should be interested to know if other practitioners in the Tropics have found this, as in view of the frequency of staphylococcal furunculosis as a sequel to malaria there might be a definite connexion.—I am, etc.,

V. RUTH SHARP.
Pemba, Zanzibar, May 28. Woman Medical Officer, Chake Chake.

Water-borne Outbreak of Paratyphoid B

SIR,—There has recently occurred in this district a small localized outbreak of paratyphoid B fever due to the consumption of a contaminated water supply.

The evidence collected has proved fairly conclusively that the outbreak—twenty cases out of a "population-at-risk" of twenty-eight—was due to the consumption of water from a pump situated in the old type of court and supplying seven houses only. *Bact. paratyphosum* B has been isolated from the water supply during the course of the investigations by three members of the Emergency Public Health Laboratory Service—namely, Prof. Wilson, Oxford, Dr. Knox, Leicester, Dr. Gell, Northampton; and, furthermore, the organism isolated has been shown to be similar culturally and serologically to the organism isolated from specimens of faeces and urine from the patients concerned. This small outbreak is of particular significance, as there is no evidence in the medical literature of an outbreak of paratyphoid fever being caused through the consumption of a contaminated water supply.

I hope very soon to be able to publish a detailed report of the investigations carried out in this very interesting and unique outbreak.—I am, etc.,

Northampton, Aug. 1. DAVID J. JONES, M.B., B.Ch., D.P.H.

Protecting Eye Shields

SIR,—May I support Mr. Harrison Butler's plea (July 19, p. 101) for issue of the Cruise vizor? As a practical rifle shot there is no question that there is no difficulty in using the rifle when the vizor is down; in fact it acts as an aperture sight and would help the myope. I cannot understand what there is to experiment on in it. It does protect, it does not obstruct, and it is cheap.—I am, etc.,

London, E.C.4, July 30. C. WYNN WIRGMAN.

*** We understand that as a result of careful and exhaustive tests it was decided not to recommend the issue of the vizor to the Forces.—ED., *B.M.J.*

Notification of Deficiency Diseases

SIR,—The two Ministries responsible for the maintenance of adequate nutrition of the population under war conditions are at present largely guided by theoretical considerations and lack the means whereby the success or failure of their work can be subjected to any but the roughest of practical tests. The only checks on the adequacy of the national dietary now available are, first, the schools' medical reports; secondly, the incidence of notifiable infectious diseases; and, thirdly, reports of death from starvation collected by way of the coroners' courts. Of these, only the incidence of actual starvation is directly linked to the question of nutrition.

The net is of too wide a mesh to discover a dangerous prevalence of a deficiency disease or subclinical avitaminosis of far wider extent. I believe that owing to the lateness of the spring vegetable season and the scarcity of imported citrus fruits there has been a considerable increase in the incidence of scurvy during last spring and the early summer, and that this could have been avoided had the authorities been aware in good time of the danger.

May I therefore use your columns to make the suggestion that, for the duration of the war at least, deficiency diseases should be made compulsorily notifiable to the Ministry of Health or to the local authority, as are certain infectious diseases? By this means the signals of danger could be received in time enough to prevent a possible outbreak of a deficiency disease by suitable publicity and the distribution of concentrated vitamins.—I am, etc.,

London, N.19, July 27. HUBERT PEARSON.

The National Loaf

SIR,—If Dr. I. Harris wrote only to the *British Medical Journal* his letter could remain unanswered, it is so barren of real argument. But someone of the same name is both disparaging the national loaf in public meetings and gaining local Press publicity for his views, and that is a very different matter.

Dr. Harris's letter is full of half-truths which are unlikely to deceive the medical reader, but I tremble to think of their effect on the layman. He says the loaf is to be fortified by calcium alone—he must know that the national wholemeal loaf has five times as much iron, twice as much fat, many times as much vitamins, and the unknown remainder present in natural whole grain but absent in the 73% extractions. He calls the calcium "chalk." Is it not a fact that calcium is added in the form of phosphate? He wants us to have our necessary calcium in milk. Is he unaware that the pre-war consumption of milk was one-fifth of a pint per day per head, and that even then two and a half million more milking cows were necessary to provide the optimum daily pint per head?

Of course we know calcium is ineffective without vitamin D, but is not this supplied with the margarine? A layman could only think that Dr. Harris says the calcium in the national loaf is ineffective. Again, he says there is not a scintilla of evidence that there is a calcium deficiency. Has calcium nothing to do with teeth? Can he produce twelve adults in working-class Liverpool with sound teeth? They have not come to North Wales as evacuees, and if white bread is not responsible for their languid pallor then it is up to Dr. Harris and his colleagues with the advantage of local knowledge to tell us what is.—I am, etc.,

Caernarvon, July 26. GRIFFITH EVANS.

Suture of Cauda Equina

SIR,—I should be very glad to know of any successful case of suture of the cauda equina. In the official history of the last war it is stated that not a single example was met with, yet most textbooks comment on its feasibility. If, therefore, through the medium of your *Journal* you are able to put me in touch with anyone who has sutured one or more elements of the cauda equina with success I shall be much obliged to you.—I am, etc.,

LAMBERT ROGERS.

c/o Medical Department, Admiralty, S.W.1, July 30.

Sydenham and the Royal College of Physicians

SIR,—Your reviewer of Prof. McDowall's *Biological Introduction to Psychology* (July 26, p. 121) states that Sydenham never became a Fellow of the Royal College of Physicians "probably owing to professional jealousies." This is not correct, as demonstrated by the documents of the College and as stated in the *Life of Thomas Sydenham* by J. F. Payne, a late Harveian librarian of the College and one of our greatest scholar physicians. Sydenham did not become a Fellow of the College because up to an advanced age he had not a doctor's degree and thus, according to the by-laws of the College at that time, was not eligible for the Fellowship. Sydenham obtained a doctor's degree only in 1676, thirteen years before his death, but even then did not apply for admission, as there is no record of any such application in the archives of the College. It is quite possible that at his age he did not feel inclined to present himself at an examination, or possibly the necessities of his practice prevented him from taking an active part in the affairs of the College, which all Fellows at that time were under obligation to do.

There is no question of professional jealousy in all this. On the contrary, according to contemporary documents Sydenham was often praised and given honour by the College.—I am, etc.,

London, W.1, July 28. A. P. CAWADIAS.

The Services

NAVAL AWARD AND MENTION IN DISPATCHES

Surgeon Lieut. G. L. Ward, R.N.V.R., has been awarded the D.S.C. for courage, skill, and devotion to duty in operations off the Libyan coast, and Temporary Surgeon Lieut. I. B. Hopkins, R.N.V.R., has been mentioned in dispatches for seamanship, resource, and devotion to duty in rescuing survivors from a merchantman which was being attacked by enemy aircraft.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL NAVY

Wounded

Surgeon Lieut. Charles John Robarts, R.N.

ROYAL ARMY MEDICAL CORPS

Missing

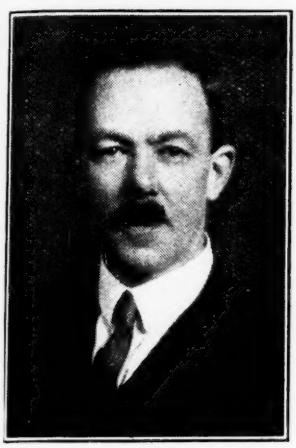
Major Patrick David Clifford Kinmont.

Obituary

A. J. CLARK, M.D., F.R.C.P., F.R.S
Professor of Materia Medica, University of Edinburgh

We announce with deep regret that Prof. A. J. Clark died in Edinburgh on the morning of July 30. He had been pharmacological adviser to the *British Medical Journal* for twenty years, and gave invaluable help at all times to the Editorial Department and to the Journal Committee. He visited London quite recently for a meeting of the Medical Research Council and seemed in his usual health, but he fell ill on July 26 and was operated upon next day.

Alfred Joseph Clark was born at Northover, Glastonbury, on August 19, 1885. He came of Quaker stock, and his father, Francis Joseph Clark, was the head of a long-established manufacturing firm at Street, Somerset. From Bootham School, York, he went up to King's College, Cambridge, and gained honours in both parts of the Natural Sciences Tripos, taking his B.A. in 1907. Under the influence of the late W. E. Dixon his physiological studies at Cambridge led on to experimental pharmacology, and at St. Bartholomew's Hospital he was clearly marked down for a scientific career. Having graduated in medicine in 1910, he held the posts of house-surgeon at Addenbrooke's and house-physician at Bart's, and took the M.R.C.P. and D.P.H. He then served in turn as demonstrator of pharmacology at King's College, London, assistant pharmacologist at University College, and lecturer on pharmacology at Guy's Hospital. In 1914 he took his Cambridge M.D., and after the war broke out entered the R.A.M.C. with a temporary commission, and received the Military Cross for gallantry and devotion to duty. When the war was over he sailed to South Africa to take up the chair of pharmacology at Capetown University, but after a short time there he was recalled to University College to fill the professorship for which he had seemed to be destined. After several happy and successful years of teaching and research in London he was appointed in 1926 to the vacant chair of materia medica in the University of Edinburgh.



Prof. Clark was elected F.R.C.P. in 1921, F.R.S.Ed. in 1927, and F.R.S. in 1931. He was a member of the Medical Research Council in 1934-8, and again from 1939 to the time of his death. He was also an active member of the Physiological Society, and served on various committees and subcommittees concerned with the actions and uses of drugs and other therapeutic substances. Besides many papers and addresses published in these columns and elsewhere he wrote four books: *Applied Pharmacology,* which was first published in 1923 and reached a seventh edition last year; *Comparative Physiology of the Heart* (1927); *Mode of Action of Drugs on Cells* (1923); and *General Pharmacology* (1938). He liked wandering down bypaths of medicine, and made a special study of the history of anaesthetics and the long tale of quackery through the ages.

The British Medical Association awarded him a research Fellowship in 1911 and 1912, and scientific grants in 1914 and 1919. He was vice-president of the Section of Therapeutics and Pharmacology at the Edinburgh Meeting of the Association in 1927 and at the Centenary Meeting in 1932, and was president of the Section of Pharmacology, Therapeutics, and Anaesthetics at Plymouth in 1938. He often visited Tavistock Square, and from 1936 onwards took part in the conferences between representatives of the Science Committee of the B.M.A. and the Pharmaceutical Society.

Sir HENRY DALE, P.R.S., writes:

British pharmacology suffers a new and heavy bereavement in the death of A. J. Clark at the early age of 56 years. The news comes as a shock to a wide circle of friends, mainly workers in the medical sciences, who knew the stimulating quality of his mind and his fine, staunch character. The natural inclination of Clark's interest appeared to be to the study of physiological reactions of a fundamental and generalized type. To this study pharmacology could make its special contribution in showing how drugs modify such reactions. He naturally chose the simplest available physiological schemes for these studies, making use largely of tissues which would survive and remain active in prolonged isolation, such as the frog's heart. To understand the action of drugs on the latter he needed and sought more exact knowledge of its contractile metabolism, the source of its energy, and the conditions determining its normal rhythm. Work on the heart gave scope for another of Clark's interests—that of a naturalist in the varying behaviour and dimensions of such an organ over a wide range of species. He recorded these explorations in a book on the *Comparative Physiology of the Heart,* in a Cambridge series. In this can be found examples of Clark's humorous delight in exhibiting the results of odd calculations and quantitative comparisons. One gets the impression that with a slight change of circumstances or opportunity Clark might easily have found his field of research in experimental zoology. His attention, however, never wandered far from his principal aim—of interpreting the actions of drugs in more fundamental terms. His speculations and researches in this field over many years were embodied in the book on *The Mode of Action of Drugs on Cells,* which brought him wide reputation in many countries, and through which his work is likely to have its most permanent effect on the progress of scientific thought and experiment.

There was, however, another and much more practical side to Clark's interest in pharmacology which must have made him a specially stimulating teacher. This is shown in his *Applied Pharmacology,* in several editions of which, from 1923 onwards, he endeavoured, in his own words, "to bridge the gap between pharmacology and therapeutics," "therapeutics" meaning the methods in actual use or in near prospect at the dates of the successive editions. It included not merely the use of old-fashioned drugs or of drugs in the ordinary sense, but the rapidly developing use of hormones, vitamins, and even radiations. This book was a really remarkable achievement, and showed the range and versatility of one whose own researches had dealt mainly with fundamental and academic problems. The section on "Systems of Medicine" in the introduction to the later editions illustrates Clark's effective use of arithmetic for the purposes of a freakish humour. Hahnemann's recommended dilution of a drug for homoeopathic medication, he tells us, "works out at a content of 1 molecule of drug in a sphere with a circumference equal to the orbit of Neptune." Clark found another opportunity for forceful play with this weapon of quantitative humour in his popular tract on *Patent Medicines,* in the "Fact" series. It is sad indeed to think that he will not be there to see the effect of legislation now before Parliament, of a kind for which his brilliant and devastating little book made such an effective plea.

In all these and in many other directions we shall sadly miss one of the brightest and most enterprising spirits from British pharmacology, and a gallant comrade from the ranks of medical research workers.

Sir EDWARD MELLANBY, F.R.S., secretary of the Medical Research Council, writes:

The sudden and unexpected death of Prof. A. J. Clark at the height of his powers is a loss to medical science which can hardly be exaggerated. I wish here to write a few words of appreciation of his work for the Medical Research Council.

He first became a member of the Council in 1934, and his period of office ended in 1938. After an interval of only one year he had the unusual experience of being re-elected to membership, a position he held at the time of his death. Thus Clark belonged to a small group of men, including F. G. Hopkins, C. S. Sherrington, T. R. Elliott, and E. D. Adrian, who have served for more than one period of four years as members of the Medical Research Council. This is just one measure of the Council's appreciation of his wide knowledge of medical science, his wisdom, his reasonableness, and his willingness and ability to help in this important public work.

By his education and natural ability Clark was exceptionally fitted to play an important part in the organization and initiation of medical research by the State. He belonged to the diminishing group of the Cambridge physiology school who were trained to study and appreciate the whole field of experimental medical science. While not necessarily specialists in any one branch, these men learned the fundamentals of experimental physiology, pharmacology, and pathology, and knew when to seek higher authority and call upon the expert for assistance in any particular direction. This did not prevent many of them from becoming leaders in particular lines of study, but never at the expense of their wider outlook. Clark's later experience at St. Bartholomew's Hospital as a medical student and house-physician rounded off his university training and served to extend his knowledge and interest to the science of disease. He succeeded in maintaining his scientific outlook on all biological phenomena, whether in the laboratory or at the bedside. It would indeed have been difficult to find anybody with wider knowledge and greater interest in all branches of medical science than Clark. In his own research his natural instincts often led him to study the more abstruse and fundamental points in biological science, especially the action of chemical agents on living cells, and yet few men have played a greater part in bringing knowledge gained in the laboratory to the practical use of medicine. It was this dual outlook—his interest in the fundamental academic science of biology and his intense appreciation of the need to interweave the work of the laboratory and the ward—which placed Clark in a unique position for helping organized medical research.

An editorial friend writes:

"A. J." was a kind, sincere, and truly modest man, devoted to the science of medicine, and ever anxious to put the laboratory into the service of therapeutics. He took a broad view of pharmacology and its future, and read diligently to keep himself abreast of new work in that rapidly growing field. There was nothing "professorial" in his manner, and indeed at times he seemed a little confused in speech, but he was a good professor, approachable, eager to learn as well as to teach, and radiating love of his subject. Honest himself, through and through, he expected no less of others; towards mere weakness or ignorance he was humorously tolerant. We have lost an understanding friend, a loyal colleague, and a trusted expert adviser.

[Photograph reproduced by Press Portrait Bureau]

Medical Notes in Parliament

Medicine and Pharmacy Bill in the Lords

In the House of Lords on July 29, on the second reading of the Pharmacy and Medicines Bill, Viscount PLUMER moved an amendment urging that the House should not proceed at present with a Bill which proposed to grant a trading privilege to pharmaceutical chemists in the sale of medicines and to deprive herbalists of their existing right to sell many herbal medicines.

Lord ADDISON urged that there was no question of haste about the Bill, which had been long wished for, apart from any professional interest, by sensible people.

Lord HORDER agreed with Lord Addison that legislation on the matter was overdue. Two important principles were established by the Bill. First, there was the principle of qualitative and quantitative disclosure. He could not help feeling that it was on the quantitative demand for disclosure that the herbalists had struck. The art and science of healing advanced very slowly, but they did advance. The advance had been made in the direction of searching out what was the essential ingredient that did good in the various plants and minerals that Nature had provided.

The advances in the treatment of disease in the last decade of this century had been in the direction of exact formulation of essential ingredients.

The second great principle which the Bill established, not for the first time but more extensively, was control over advertisements. The "fear advertisement" was highly dangerous. There was a crying need still for more control over a form of advertisement which was not dealt with in the present Bill. He had been given an assurance that the Government were prepared to inquire into the working of the Bill after a reasonable time had elapsed. That, with the statements of the Minister of Health in the House of Commons, might be regarded as a pledge that the Government would make at least a full survey of the whole position in the near future. The Bill was a step in the right direction and would conduce to the common health.

Lord Plumer withdrew his amendment.

After further debate, the Lord Chancellor said he agreed with Lord Horder that the Bill went in the direction of reform on two or three matters where reform was very much overdue.

The Bill was read a second time.

Mr. Churchill on Work, Rest, and Diet

During his speech in the House of Commons on the production of war materials, on July 29, Mr. CHURCHILL said that in the three months after Dunkirk our people worked to the utmost of their moral, mental, and physical strength. Men fell exhausted at their lathes, and working men and women did not take their clothes off for a week at a time. Meals, rest, and relaxation all faded from their minds, and they just carried on to the utmost limit of their strength. There were one or two reasons why we could not wholly recapture and maintain indefinitely the intense personal efforts of a year ago. We should win the war largely by staying power. For that purpose there must be reasonable minimum holidays for the masses of the workers, one day in seven of rest as a general rule, and, subject to coping with bottle-necks and with few emergencies which knew no law, a few breaks, and, where possible, one week's holiday a year. Allowances must be made for the very severe change in the diet of the heavy manual worker. It was quite true that no one had gone short of food, and there had been no hunger, but no one could pretend that the diet of the British people, and especially of the heavy workers, had not become far less stimulating and interesting than it was a year ago. Except for the fighting Services we had been driven back to a large extent from the carnivore to the herbivore. That might be quite satisfactory to the dietetic scientists, who would like to make us all live on nuts, but it had produced and was producing a very definite effect on the energetic output of the heavy worker. More meat was wanted in the mines and in the foundries, and more cheese. Great arrangements had been made to send food from America in nourishing, varied, and more interesting quantities. Every effort would be and was being made to supplement this deficiency, and he shared the hope of the Minister of Food and the Minister of Agriculture that our rations in 1942 would be more stimulating and more nourishing than in 1941.

American Doctors for Britain

On July 29, Sir HENRY MORRIS-JONES asked the Minister of Health what progress had been made with the proposal, recently announced by him, for securing the services of 1,000 doctors from the United States of America to help in the medical services of this country. Miss HORSBRUGH replied that the scheme had not yet become fully operative. According to information recently received from the American Red Cross about eighty United States doctors who had applied under the scheme were at present being considered for acceptance, in addition to one who had already arrived and was at work in a civil hospital and four who were on their way to this country.

N.H.I. Statistics

On July 29, Miss HORSBRUGH, replying to Mr. Thorne, stated that on December 31, 1939 (the latest date for which such information could be given), the number of insured persons in

Great Britain was: men and boys, 14,204,000, including 141,000 deposit contributors; women and girls, 7,243,000, including 155,000 deposit contributors. The total sum paid out in benefits in the year ended December 31, 1940, was £34,197,000, the accumulated funds at that date amounted to £146,799,000, and the amount invested by or on behalf of approved societies to £61,224,000. The expenditure in the year ended December 31, 1940, on sickness, disablement, and additional benefits was:

	Men	Women	Total
	£	£	£
Sickness benefit ..	8,114,000	4,024,000	12,138,000
Disablement benefit	3,781,000	2,029,000	5,810,000
Additional benefits:			
Cash	1,479,000	304,000	1,783,000
Non-cash ..	—	—	2,416,000

(Separate figures in weeks were not available.)

The fifth valuations of the approved societies would be completed during the coming autumn, and it was expected that a short report by the Government Actuary, incorporating some statistics of the results, would be available early next year.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

In England and Wales there was a decline in the incidence of the principal notifiable diseases during the week, with the exception of dysentery and enteric fever; the former is over four times and the latter over three times as prevalent as last year. Though a seasonal rise in these diseases may be expected, especially during hot weather, the recent increases would give cause for alarm were it not that the prevailing type is mild—namely, Sonne dysentery and paratyphoid B fever. On the other hand, acute poliomyelitis—another disease of hot dry weather—is exceptionally infrequent. Cerebrospinal fever, in respect of which an exacerbation was recorded last week, is at exactly the same level as last year, and in Scotland at nearly the same level.

Enteric Fever

The Lancaster outbreak, involving Liverpool chiefly, has surpassed that of Birmingham and district in both magnitude and geographical distribution, being widely scattered over the county and in the adjacent county of Chester, chiefly in Birkenhead. No details are as yet available as to the source and mode of spread of the infection. Apart from the counties heavily affected, no area recorded more than 6 cases: Lancaster 146 (Bootle 9, Liverpool 79, Manchester 15, Preston 2, St. Helens 18, Salford 2, Southport 1, Wigan 1, Ashton-under-Lyne M.B. 1, Crosby M.B. 2, Failsworth U.D. 1, Huyton with Roby U.D. 1, Irlam U.D. 1, Morecambe and Heysham M.B. 1, Prescot U.D. 1, Urmston U.D. 1, Widnes M.B. 4, West Lancashire R.D. 4, Whiston R.D. 1, Wigan R.D. 1); Chester 63 (Birkenhead 28, Chester 1, Stockport 1, Wallasey 14, Bebington M.B. 16, Dukinfield M.B. 1, Ellesmere Port U.D. 1, Wirral U.D. 1); Stafford 21 (Stoke-on-Trent 11, Wolverhampton 1, Newcastle-under-Lyne M.B. 1, Stafford M.B. 6, Stone R.D. 2). In Scotland, of the 24 cases notified 5 (3 in Glasgow and 2 in West Lothian) were of typhoid fever; the remaining cases were recorded in Glasgow 7, Dundee 6, the counties of Ayr and Lanark 2 each, Dumbarton County 1, Moray and Nairn County 1.

Dysentery

Only fourteen administrative areas were affected by dysentery, compared with twenty-nine with enteric fever. In none was incidence heavy or widespread, and only in three were there more than 6 cases—namely, Essex 21, all in Brentwood U.D.; Lancaster 13 (Blackburn C.B. 1, R.D. 4, Warrington R.D. 7, Whiston R.D. 1); West Riding of Yorkshire 13 (Bradford 5, Wakefield 1, Aireborough U.D. 7). In Scotland, of the 35 cases notified 11 were in Dundee, 6 in Edinburgh, 5 in Glasgow, 3 each in Coatbridge and Paisley, and the remaining 6 in four counties and one burgh.

No. 28

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics for the British Isles during the week ended July 12.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (*a*) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire. (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941 (a)	(b)	(c)	(d)	(e)	1940 (Corresponding Week) (a)	(b)	(c)	(d)	(e)
Cerebrospinal fever ..	184	7	37	2	7	184	14	35	—	3
Deaths		4	6				—	4		
Diphtheria	773	31	161	22	25	726	28	242	23	23
Deaths	21		3	2	2	23		12	—	1
Dysentery	68	3	35	5	—	15	1	53	—	—
Deaths			—	—	—			2	—	—
Encephalitis lethargica, acute	3	—	—	1	—	3	1	—	—	—
Deaths		—	—				2	1		
Enteric (typhoid and paratyphoid) fever	318	6	24	5	1	94	12	7	4	1
Deaths	3	—	—	—	—	—	—	—	—	—
Erysipelas		—	43	10	2		21	43	3	2
Deaths		—	—				—	1		
Infective enteritis or diarrhoea under 2 years										
Deaths	41	3	11	13	1	27	5	5	4	5
Measles	5,368	153	49	155	4	9,082	31	1,149	—	17
Deaths	8	—	1	3	—	4	1	9	1	—
Ophthalmia neonatorum	99	4	19		1	90	4	20		—
Deaths										
Pneumonia, influenzal*	531	23	3	2	2	457	20	2	—	2
Deaths (from influenza)	6	13	1	—	3	8	—	2	—	1
Pneumonia, primary ..			119	21				134	4	
Deaths		—		9	—		21		3	3
Polio-encephalitis, acute	—	—				4	—	*		
Deaths		—					—			
Poliomyelitis, acute ..	—	—	6	2	1	26	—	4	—	—
Deaths		—	—				—	—		
Puerperal fever ..	2	2	8	3	—	4	4	8	4	—
Deaths		—					—			
Puerperal pyrexia ..	127	8	31	2	—	134	12	16	—	—
Deaths										
Relapsing fever ..	—	—			—	—	—			—
Deaths										
Scarlet fever	732	30	99	59	16	1,262	21	128	32	59
Deaths	3	1	—	—	—	—	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus fever	—	—	—	—	—	—	—	—	—	—
Deaths			—	—	—			—	—	—
Whooping-cough ..	4,840	259	55	40	7	738	6	40	—	8
Deaths	26	4	6	1	—	3	—	1	2	1
Deaths (0–1 year) ..	268	20	62	32	10	295	36	56	20	18
Infant mortality rate (per 1,000 live births)										
Deaths (excluding still-births)	4,018	521	565	186	112	4,060	622	595	183	121
Annual death rate (per 1,000 persons living)			12·3	12·3	†			12·0	12·2	10·6
Live births	4,833	368	864	334	226	6,551	991	952	338	229
Annual rate per 1,000 persons living ..			17·6	22·2	†			19·3	22·6	20·1
Stillbirths	183	13	35			216	30	38		
Rate per 1,000 total births (including stillborn)			39					38		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

† Owing to evacuation schemes and other movements of population birth and death rates for Northern Ireland are no longer available.

Universities and Colleges

ROYAL COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At the quarterly meeting of the Council, held in the College House on July 26, with the President, Prof. W. Fletcher Shaw, in the chair, the following officers were elected to take office in October.

President: Prof. W. Fletcher Shaw. *Vice-Presidents:* Mr. Eardley Holland and Prof. C. G. Lowry. *Honorary Treasurer:* Mr. J. P. Hedley. *Honorary Secretary:* Mr. G. F. Gibberd. *Honorary Librarian:* Wing-Commander F. W. Roques, R.A.F.V.R. *Honorary Curator of Museum:* Mr. Aleck W. Bourne.

The following were admitted: *To the Fellowship:* N. L. Edwards, W. A. Taylor, R. Watson. *To the Membership:* J. Joseph.

The following candidates were elected to the Membership: G. Boyd, D. S. Foster, E. Gledhill, Constance E. Peaker, Kathleen M. Robinson, Katharine C. Rogers, R. X. Sands, Violet E. A. Sykes, G. Wynn-Williams.

Medical News

The Annual Congress of the Ophthalmological Society of the United Kingdom will be held, circumstances permitting, in Cambridge on September 4 and 5, 1941. The subject for discussion will be "Ocular Injuries resulting from the War," and the openers will be Dr. O. M. Duthie (Manchester) and Dr. S. Zuckerman (Oxford). It is possible that all male members can be accommodated in college. It is desired that all who hope to attend will notify at an early date the honorary secretary, Mr. Frank W. Law, F.R.C.S., 36, Devonshire Place, London, W.1.

Medical practitioners are informed that the Food Rationing (Special Diets) Advisory Committee of the Medical Research Council has recommended that persons suffering from nephrosis or the nephrotic type of glomerulo-nephritis should be granted three extra meat rations a week. Doctors may therefore complete certificates on behalf of their patients suffering from these diseases for submission by the patient to the local Food Office.

The Board of Education has asked local education authorities to review their school medical services, with a view to releasing doctors and dentists for the Services. Routine medical inspection of school entrants must be maintained, but many other surveys, it is suggested, might be undertaken by school nurses, while doctors of foreign nationality who have been registered in this country might be employed.

Four years ago the National University of Mexico founded its social service system under which every medical graduate is required to practise for five months as a health officer in some part of the country where there is no such representative. He sends in a weekly report of contagious diseases cases seen, and a monthly report which includes information on sanitary questions such as water supply and drainage. Since 1935 more than 100 graduates have taken part in this social service programme.

Lieut.-Colonel Sir Henry Gidney, I.M.S. (ret.) has been appointed a member from British India on the new Indian National Defence Council.

Dr. Gerhard Domagk, professor of morbid anatomy at Münster, who first introduced prontosil, has been made an honorary member of the Spanish Academy of Dermatology and Syphilology.

The May issue of *Annals of Surgery* is a special number devoted to "Surgical Preparedness Symposia."

The Canadian Red Cross Society will send 300,000 lb. of Canada's jam to Britain this year.

A new wing in the Salvador Hospital at Santiago, Chile, has been dedicated to the memory of Harvey Cushing.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A. HOUSE, TAVISTOCK SQUARE, W.C.1.

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone unless the contrary be stated.

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QUERIES AND ANSWERS

Income Tax

Employment by Self and Wife: Housekeeper

"GAMMA" is employed as non-resident medical superintendent of a municipal hospital, and his wife has been appointed whole time to the staff of the M.O.H. for the duration of the war. Consequently it has been necessary to employ a housekeeper. Can an allowance be claimed for this expense?

*** No. The point was decided in the case of Brewers *v.* Harding on very similar facts.

LETTERS, NOTES, ETC.

An M.O.H. and the R.M.B.F.

Dr. LEWIS G. GLOVER, honorary treasurer of the Royal Medical Benevolent Fund, writes: I desire to acknowledge through your columns the receipt of the following letter, signed "Medical Officer of Health," in recognition and gratitude to you as well as to the donor. "I recently noticed in the medical press the suggestion that doctors who have received kindness in the form of medical attention to themselves and their families from other doctors should recognize the fact by making a grant to the Royal Medical Benevolent Fund which, to a certain extent, expressed their gratitude. The difficulty of making some return is increased when the recipient doctor is a medical officer of health. I think the suggestion made is therefore helpful, and I propose to follow it in the future and now enclose a 'token' subscription representing in a small way my appreciation for the kindness displayed to myself and family by medical practitioners." As the "token" was a very generous cheque I desire to express my grateful thanks both to the donor and also to you. It is possible that others who may read this letter may be encouraged to follow the example which I am glad to record is being taken up.

Ether Convulsions

Dr. C. LEONARD TRAYLEN (London, N.W.10) writes: May I point out that in my letter (July 12, p. 67) no stress is laid on the fact that no hot ether was used. Dr. Charles Wells was inclined to suggest that this was a cause.

Problems of the Circulation

Dr. G. ARBOUR STEPHENS (Swansea) writes: Prof. McDowall is to be thanked for his two lectures on the problems of the circulation (July 12 and 19), in which he pleads for a closer relation between physicians and physiologists, and deprecates the restriction of diagnosis to restricting formulae. It is interesting in this connexion to note that he, as a physiologist, believes that a muscle when it contracts produces no sound, while teachers of medicine contradict him when they say the sounds of the heart are due in part to the contraction of the heart muscle. Prof. McDowall speaks of "high pressure," but does not define it. In 1932 I pointed out that the height varies according to the width of the armlet, and for that reason emphasized the need for a standard width. He makes no reference to what I hold is of great importance—namely, the restriction of blood flow into the vasa vasorum when the pressure on the blood in the arteries is increased. I hold that the ratio of the systolic pressure to this pressure in the arteries, against which the heart stroke has to pump the blood, is of the greatest importance in connexion with cardiological problems.